The ADVERTISERS' INDEX

A

Ajax Iron Works
Alco Products, Inc.
Alton Railroad Co., The 85
Allegheny Steel Co.
Allis-Chalmers Mfg. Co. 73
Allis, Louis, Co., The 106
Allsteel Products Mfg. Co., Inc., The
Aluminum Co. of America
American Cable Co., Inc.
American Cast Iron Pipe Co.
American Iron & Machine Works Co.
American Meter Co. 65
American Radiator Co.
American Rolling Mill Co., The
American Sheet & Tin Plate Co.
American Stainless Steel Co.
American Steam Pump Co.
American Steel & Wire Co. 3
American Steel Works
American Tank & Equipment Corp.
American Well Works, The
Anchor Post Fence Co.
Armstrong Machine Works
Automotive Distillate Corp.
Athey Truss Wheel Co.
Axelson Mfg. Co., Ltd.
Ayer & Lord Tie Co.

B

Badger, E. B., & Sons Co.
Badgett Steam Lubricator Co.
Baker Oil Tools, Inc.
Barber-Greene Co.
Barold Sales Co.
Barnsdall Refineries, Inc.
Barrett Co., The
Bethlehem Steel Co.
Bigelow-Liptak Corp.
Bignall & Keeler Machine Works
Black, Sivalls & Bryson, Inc.
Bradford Motor Works, Inc. 111
Brauer Machine & Supply Co.
Braun, C. F., & Co. 88
Brewster Co., Inc., The
Bridgeport Machine Co. 29
Bristol Co., The
Broderick & Bascom Rope Co.
Broderick Co., The
Brown Instrument Co.
Buckeye Traction Ditcher Co. 8
Burford Oil Co.
Butler Mfg. Co. 41
Byers, A. M., Co. 57
Byron Jackson Co. Back Cover

C

Carey, Philip Co., The
Caterpillar Tractor Co.
Chain Belt Co.
Chaplin-Fulton Mfg. Co., The 108
Chapman Valve Mfg. Co., The
Chicago Bridge & Iron Works 67
Clark Brothers
Classified Wants 74-75
Cleveland Trencher Co., The
Colona Mfg. Co.
Columbian Rope Co.
Columbian Steel Tank
Columbus Forge & Iron Co., The
Continental Supply Co., The
Cooper-Bessemer Corp., The 36
Corona Products, Inc.
Crane Co.

D

Darling Valve & Mfg. Co.
Dart, E. M., Mfg. Co. 119
Davey Compressor Co.
Davis Regulator Co.
Dearborn Chemical Co.
Dehdyro, Inc.
Devine Mfg. Co., Inc., J. P.
Diamond Rubber Co.
Dixon Crucible Co., Joseph
Dodge Brothers Corp.
Donovan Boiler Works, Inc.
Dresser, S. R., Mfg. Co. 21
Driftmeter, Inc.

E

Eagle-Picher Lead Co.
East Texas Refining Co.
Economy Pump & Tool Co., The
Edward Valve & Mfg. Co., Inc.
Elliott Mfg. Co.
Empire Oil & Refining Co.
Emsco Derrick & Equipment Co.
Ethyl Gasoline Corp.
Exchange Banks of Tulsa

F

Falk Corp., The
Fenwick-Reddaway Mfg. Co.
Fisher Governor Co.
Foster Wheeler Corp. 91
Foxboro Co., Inc., The
Franklin Valveless Engine Co.
Frick-Reid Supply Corp.
Frisco Lines 85

G

Gardner-Denver Co.
Garlock Packing Co., The 39
Gaso Pump & Burner Mfg. Co. Inside Back Cover
Gates Rubber Co.
General American Tank Car Corp. 4
General Electric Co.
General Paint Corp.
Globe Oil Tools Co.
Goodrich, B. F., Rubber Co., The
Goodyear Tire & Rubber Co.
Gott, H. P., Mfg. Co., Inc.
Gould Pumps, Inc. 42
Granite City Steel Co.
Gray Processes Corp., The 58
Griscom-Russell Co., The
Guiberson Corp., The
Gulf Refining Co.

H

Halliburton Oil Well Cementing Co.
Harrisburg Pipe & Pipe Bending Co.
Hazard Wire Rope Co. 55
Hedges-Walsh-Weidner Co., The 108
Heeter, Sons & Co., Inc., C. M.
Hercules Motors Corp.
Hercules Supply Co.
Hercules Tool Co.
Heydrick Mapping Co. 110
Highland Iron & Steel Co., The
Hill, Hubbell & Co.
Hope Engineering Co. 52
Hough, Charles N., Mfg. Co., The
Hughes Tool Co. 48
Humble Oil & Refining Co.

I

Industrial Dallas, Inc.
International Harvester Co. of America
International Nickel Co., Inc., The
International-Stacey Corp. 84
International Supply Co.

J

Jackson Co., Byron Back Cover
Jackson Engineering Corp.
Jarecki Mfg. Co.
Jenkins Bros.
Jerguson Gage & Valve Co. 109
Johns-Manville Corp.
Jones & Laughlin Steel Corp.

K

Kellogg, M. W. Co., The
Kennedy Valve Co., The 105
Kerotest Mfg. Co.
Key Boiler Equipment Co.
Kirk-Morrow Iron Works, Inc.

L

Landis Machine Co., Inc.
Layne & Bowler Co.
Leader Iron Works, Inc. 111
Leeds & Northrup Co.
Lemmons, Inc., Henry L.
Leonard Construction Co.
Lincoln Electric Co.
Linde Air Products Co. 2
Longyear, E. J., Co.
Lucey Products Corp.
Ludlow Valve Mfg. Co.
Lufkin Foundry & Machine Co., The
Lummus Co., The
Lunkenheimer Co., The

Mc

McAlear Mfg. Co., The
McClintic-Marshall Corp.
McCord Radiator & Mfg. Co. 62
McKee, Arthur G., & Co.

M

MacClatchie Mfg. Co.
Magnolia Petroleum Co.
Mair, D. S., Machinery Corp.
Maloney Tank Mfg. Co.
Marshall Chamber of Commerce
Marsh Gauge Pole Co.
Martin-Decker Corp.
Mathieson Alkali Works, Inc., The
Merco Nordstrom Valve Co.
Metric Metal Works 65
Michigan Valve & Foundry Co.
Mid-Continent Map Co.
Midwest Piping & Supply Co., Inc.
Mine Safety Appliance Co.
Moon Mfg. Co., The
Moore, Lee C., & Co., Inc.
Moorlane Co., Inc.
Moser Manufacturing Co.
Munn & Co. 110

N

National Airoil Burner Co. 110
National Equipment Co.
National Lead Co.
National Supply Co.
National Tank Co.
National Transit Pump & Machine Co. 19
National Tube Co.
Naylor Pipe Co.
Neilan Co., Ltd.
North American Car Corp.

O

Oakite Products, Inc. 67
Ohio Injector Co., The
Oil Conservation Engineering Co., The
Oil Well Supply Co.
Oxweld Acetylene Co. 2

P

Page Fence Assn.
Paraffine Companies, Inc., The
Parkersburg Rig & Reel Co., The 7
Patterson-Ballagh Corp.
Penberthy Injector Co. 23
Petroleum Engineering, Inc.
Petroleum Equipment Co.
Petroleum Iron Works Co.
Pickering Governor Co., The 111
Pittsburgh-Des Moines Steel Co.
Pittsburgh Equitable Meter Co.
Pittsburgh Screw & Bolt Corp.
Pittsburgh Steel Products Co.
Plymouth Cordage Co.
Pomona Pump Co. 111
Powell, William, Co.
Power Mfg. Co., The
Power Piping Co. 67
Prescott Co., The 51
Prest-O-Lite Co., Inc., The 2

P

Public Service Co.
Pure Oil Co., The 61

R

Reading Iron Co.
Reading-Pratt & Cady Co., Inc.
Regan Forge & Engineering Co.
Reid, Joseph, Gas Engine Co.
Republic Steel Corp.
Republic Supply Co.
Robinson Orifice Fitting Co.
Roebling's, John A., Sons Co.
Ross-Meehan Foundries Co.

S

St. Louis Cordage Mills
Shaffer Tool Works
Sherwin-Williams Co. 68
Smith Bros. Construction Corp. 110
Smith Separator Co.
Smooth-On Mfg. Co. 107
South Chester Tube Co.
Southwestern Construction Corp.
Spang, Chalfant & Co., Inc. 77
Sperry-Sun Well Surveying Co.
Stockham Pipe & Fittings Co.
Stoody Co.
Sullivan Machinery Co.
Sureshot Torpedo Co.

T

Tagliabue, C. J., Mfg. Co. 107
Taubman Supply Corp.
Taylor Forge & Pipe Works
Technical Products, Inc.
Texas Electric Service Inside Front Cover
Texas Steel Co. 110
Timken Roller Bearing Co., The Front Cover
Titusville Iron Works Co.
Toledo Pipe Threading Machine Co., The 105
Trackson Co.
Tretolite Co.
Trimont Mfg. Co.
Truman Smith Const. Co., The
Truscon Steel Co.
Tube Turns, Inc. 5

U

Union Carbide & Carbon Corp. 2
Union Wire Rope Co. 80
United Engineers & Constructors
United States Steel Corp.
Universal Oil Products Co. 27

V

Vacuum Oil Co., The
Vellumoid Co., The
Vickers Machine Co.
Victaulic Co. of America
Vogt, Henry, Machine Co.

W

Wagner Electric Corp. 6
Wailes, Dove-Hermiston Corp. 33
Walworth Co. 1
Warren Petroleum Co.
Waukesha Motor Co.
Westco Pump Corp.
Westcott Valve Co. 1
Western Gas Construction Co., The
Westinghouse Electric & Mfg. Co., The
Wickwire Spencer Steel Co.
Wico Electric Co.
Williamsport Wire Rope Co.
Wilson-Snyder Mfg. Corp.
Winkler-Koch Engineering Co., The 63
W. K. M. Co., Inc.
Worthington Pump & Machy. Corp.
Wright Manufacturing Co.
Wyatt Metal & Boiler Works

Y

Young Engine Corp.
Youngstown Sheet & Tube Co., The

The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

VOL. 30. NO. 23 TULSA, OKLAHOMA, OCTOBER 22, 1931

Copyright, 1931, by The Petroleum Publishing Co.

Table of Contents

SPECIAL ARTICLES

Production Situation More Promising ... 11
By Andrew M. Rowley
Output still below requirements. Stronger gasoline market increases hope for better crude oil prices.

Gasoline Pipe Line Expansion Imminent ... 13
By Andrew M. Rowley
Successful operation of existing lines place refiners without this means of transportation at disadvantage.

Cleaning Old Wells Increases Earnings ... 14
By L. G. E. Bignell
Application of modern methods to old properties reduces costs.

Martial Law Needed in East Texas ... 14
General Wolters explains situation. Governor firm.

Cam Bloom Drilled Two Famous Wells ... 15
By Thomas F. Smiley
One opened Kansas fields, other Oklahoma's oldest producing well.

Forty Fields Produced Half the Oil ... 16
By James McIntyre
Combined productive areas only 59 per cent of Rhode Island.

A. G. A. Endorses Five-Year Plan ... 17
By A. E. Mockler
Next annual meeting at Atlantic City October 10, 1932.

Conservation of Natural Gas Essential ... 17
By Judge H. O. Caster
Two billions now invested in natural gas industry.

Request Right to Control Production ... 18
U. S. Chamber of Commerce to vote on curtailment of output.

A. P. I. Refinery Statistics ... 18

Actually Better (Editorial) ... 20

All Argentine Crudes Favor Cracking ... 22
By E. F. Nelson and Gustav Egloff
Analyses of production show relatively light oil yields.

Improved Distant Recording System ... 24
By L. G. E. Bignell
New method of registering pressures in pipe lines, tanks, reservoirs and other containers located at some distance from central office.

California Gas Conservation Law Before Supreme Court ... 25

Consumption of Gas Increased in 1930 ... 28
Texas continues leading producer. Interstate transportation grows.

Development of Gasoline Specifications ... 30
By C. K. Francis, Ph.D.
Improvement in quality of motor fuels rapid and extensive. Regulations lag.

Pipe Line Construction News ... 32

Field Problems and Their Solution ... 54
Edited by Thomas F. Smiley

Scouting With The Journal's Cameras ... 60

Sand Pressure Control in East Texas ... 72
By Harold Vance and Verne Fagin
Belief allowable should be based on that factor rather than acreage.

Texas I. P. A. Meets at Tyler ... 102

Oklahoma Oil Men Discuss Tax Measures Initiated by Murray ... 103

Chief Justice Hughes on Despotism ... 104

FIELD OPERATIONS

Late Fields ... 24

East Texas ... 25
By L. E. Bredberg

West Texas, North Texas, Panhandle ... 26
By L. E. Bredberg

Oklahoma ... 34
By W. A. Spinney

Kansas ... 37
By W. A. Spinney

North Louisiana-Arkansas ... 38
By J. R. Crumpton

Gulf Coast ... 40
By Neil Williams

Southwest Texas ... 43
By B. D. Stevenson

Rocky Mountain Area ... 44
By Tolbert R. Ingram

Canada ... 45
By Victor Lauriston

California ... 46
By L. P. Stockman

Central West, Kentucky, Michigan ... 50
By George A. Whitney

Eastern Fields ... 50
By Staff Correspondent

REFINING AND MARKETING

General Advance in Oklahoma Market ... 12
By C. O. Willson
Gasolines, kerosene, furnace oil, gas oil and high gravity fuels participate in price increases.

Technical Questions Answered ... 59

Octane Numbers Main Topic in Chicago ... 78
By Robert C. Conine
Regular grades may be established at 70 with premium grade about 77.

Fuels and Gasoline Reduced in East ... 79
By A. E. Mockler
Bunker and Diesel oil quotations lowered 10 cents; gasoline one-fourth to half cent.

Brief Items for Petroleum Refiners ... 89

Natural Gasoline Manufacture ... 90

Refinery and Crude Prices ... 92-93

Tank Wagon Quotations ... 94

Of Interest to Sales Departments ... 95

DEPARTMENTS OF GENERAL INTEREST

The Advertisers' Index ... 9

Personal Paragraphs About Oil Men ... 49

Natural Gas Developments ... 53

Oil Industry Supplies and Equipment ... 56

Classified Want Advertisements ... 74-78

Oil Securities Markets ... 96-97

Crude Petroleum Statistics ... 112

BRANCH OFFICE CORRESPONDENTS

L. E. Bredberg, 601 Petroleum Building, Fort Worth, Tex.
Robert C. Conine, Room 1416, 6 North Michigan Ave., Chicago, Ill.
J. R. Crumpton, 540 Ricou Brewster Building, Shreveport, La.
Paul A. Elliott, Chronicle Office, Muskegon, Mich.
Tolbert R. Ingram, 130 State Office Building, Denver, Colo.
Charles E. Kern, 606 District National Bank Building, Washington, D. C.
Victor Lauriston, 35 Stanley Ave., Chatham, Ontario, Canada.
B. E. V. Luty, Bessemer Building, Pittsburgh, Pa.
A. E. Mockler, Rooms 1919-21, No. 154 Nassau Street, New York, N. Y.
B. D. Stevenson, 1504 Milam Building, San Antonio, Tex.
L. P. Stockman, 522 Union Oil Building, Los Angeles, Calif.
Leon H. Walter, Oil City Derrick, Oil City, Pa.
George A. Whitney, Box 98, Main Post Office, Toledo, Ohio.
Neil Williams, 1316 Second National Bank Building, Houston, Tex.

Refinery Section Starts on Page 78

Production Situation More Promising

Highest production in 1930, week ending Feb. 22, average daily output 2,699,096 bbls. Peak of U. S. production, week ending Aug. 24, 1929, average 2,975,435 bbls.

Output Still Below Requirements. Stronger Gasoline Market Increases Hope for Better Crude Oil Prices

By Andrew M. Rowley

Lowest daily average crude oil production in the United States during 1930 was for week ending Dec. 27 with average output of 2,144,074 bbls.

Crude oil production in the United States last week, with all fields opened, averaged about 25,000 barrels daily below the figures estimated as needed for requirements. It is probable there will be a decrease in output of the East Texas fields during this week but Oklahoma may show a gain. The production of Texas last week was 105,000 barrels daily above the allowable recommended recently by the Oil States' Advisory Committee, which allowable was indorsed and accepted by state officials of Texas.

Consequently, with the output of the nation as a whole below requirements even with Texas overproducing more than 100,000 barrels daily, the production situation is in good shape and the outlook most promising. The gasoline market in the Mid-Continent area continues to strengthen despite a slight weakening in the East. This condition is expected to be reflected in higher crude oil prices. Rumors were current this week of an impending advance in posted prices for crude oil in California.

Surveys being made as to crude oil reserves and future production by a number of large companies serve to strengthen the belief the statistical position of the industry is especially good and that better prices are fully justified. One company which has made a close check of the situation in Oklahoma says its survey shows that the oil reserves from present developed fields in Oklahoma will last only five years. As the different companies consider future requirements, the belief grows that conservative programs to develop additional reserves must be inaugurated within the very near future.

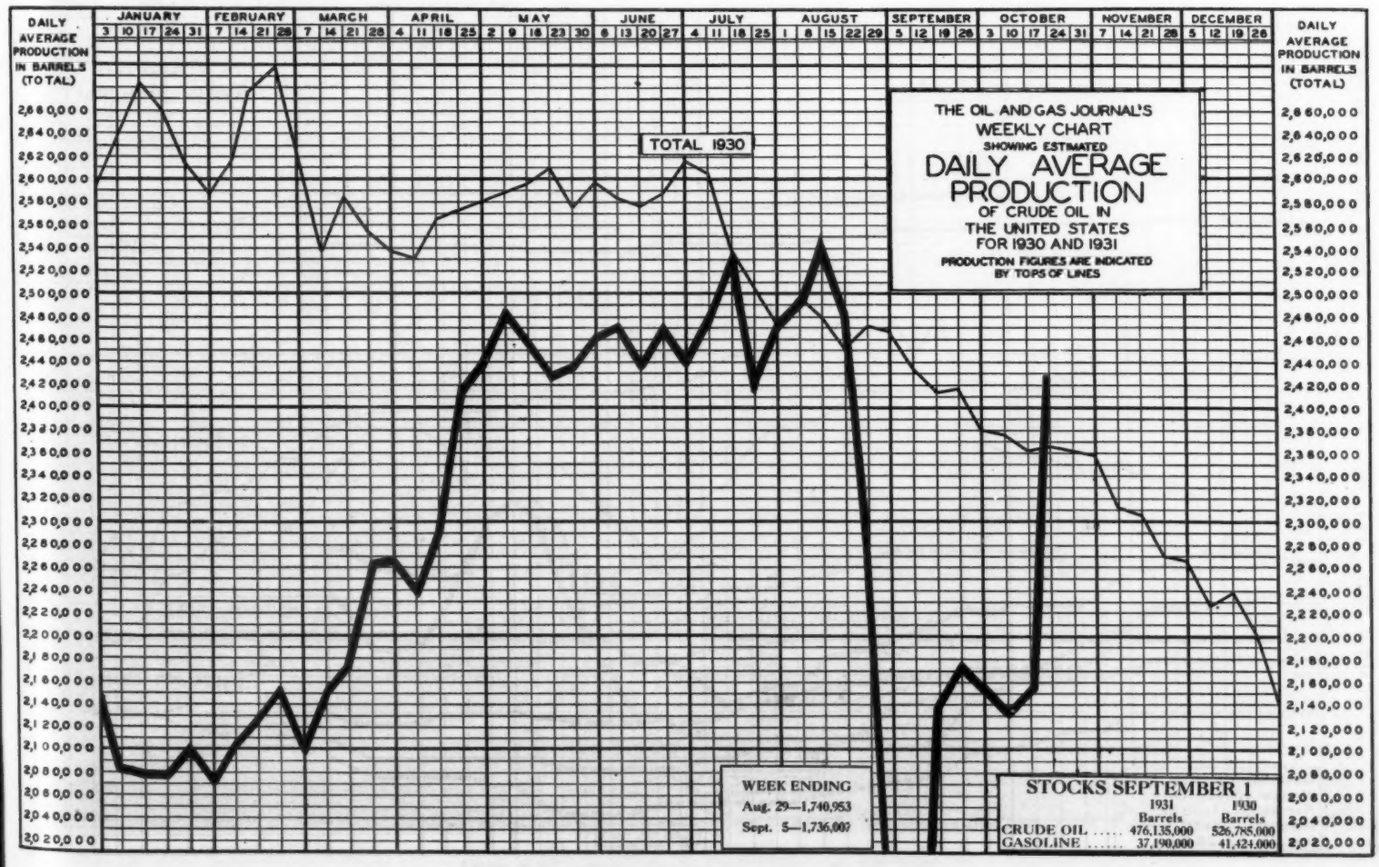
Field operations have been below normal for a long time and while most companies deprecate any talk of drilling campaigns the fact remains they must protect their interests by providing adequate crude oil reserves for future requirements and no way yet has been found to do this except by drilling. It takes a long time and a lot of drilling to open fields such as Seminole, Oklahoma City and East Texas and large areas must be tested with many wells before discoveries are made, if the past record of operations—completions and dry holes—is any criterion.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of crude oil in the United States for week ended October 17 and a comparison with the previous week follows:

	Oct. 17	Oct 10
Oklahoma—		
Oklahoma City	165,715	1,890
Seminole-St. Louis	122,360	54,415
Remainder of State	217,140	194,830
Total Oklahoma	505,215	251,135
East Texas—		
Kilgore	160,513	155,482
Lathrop	113,331	104,901
Joiner	148,345	143,501
Total East Texas	422,189	403,884
West Texas	202,487	203,793
North Central Texas	80,416	78,434
Texas Panhandle	64,918	64,536
East Central Texas	56,195	57,735
North Louisiana	29,505	28,375
Arkansas	37,970	37,490
Kansas	101,670	107,415
Total Mid-Continent area	1,500,565	1,232,797
Gulf Coast—Texas	118,256	116,344
Gulf Coast—Louisiana	30,335	29,900
Southwest Texas	62,955	61,046
Eastern	116,000	118,000
Rocky Mountain area	92,759	92,427
California—		
Santa Fe Springs	69.000	60,500
Long Beach	74,750	76.500
Playa Del Rey	20.750	21.250
Elwood	24,750	25,000
Kettleman Hills	64 000	60,500
Remainder of State	263,750	261,250
Total California	508,000	505,000
Total United States	2,428,870	2,155,514

→ **Increase 273,356 Bbls. Daily** ←



General Advance in Oklahoma Market

Gasolines, Kerosene, Furnace Oil, Gas Oil and High Gravity Fuels Participate in Price Increases

By C. O. Willson

The refined market in Oklahoma (Group 3) continued to stiffen during the past week with price advances in several products. The Oklahoma situation reflects general conditions in the Mid-Continent and Middle West refinery markets.

Refinery gasolines advanced from one-eighth to three-eighths cents per gallon for the seven-day period ending Tuesday and the U. S. Motor grade with a low of 3⅝ cents and a high of 4 cents was strong and predictions were made that the 4-cent price would be the low of the market before the end of the week. Natural gasolines due to an exceptionally heavy demand were also strong despite the substantial increase in production brought about by the reopening of the Oklahoma City and Seminole Fields in Oklahoma.

In addition to gasolines, the Oklahoma market the first of the week presented as strong a front as any time this year. A seasonal improvement in the demand for furnace oil distillates, gas oils and high gravity fuel oils has resulted in additional evidence of the scarcity of these products at Mid-Continent refineries. Open market buyers of these products found that the higher quotations were not adding to the material available on the market from day to day.

An unusual development in the furnace oil market is the fact that the lower gravities are bringing as high prices as the higher gravity oils. The 32-36 gravity zero to 10 grade with a flash under 190 was not available in Oklahoma the first of the week under 1⅝ cents. This price applied to both the dark and straw grades. The regular grades of straw, amber and prime color furnace oils varying in gravity from 36 to 40 were also quoted at a low of 1⅝ cents. The demand was greatest for the low cold test, low flash gas oils and at least one refiner in Oklahoma was quoting this product at a higher price than a 38-40 gravity prime white grade. This situation is due to the fact that with proper flash and cold test, the low gravity furnace oils are better fuels for many burners than the higher gravity distillates due to the higher B.t.u. rating.

The strong market for the regular grades of furnace oils included the higher gravity grades of fuel oils. Trading is light in these grades for the reason that there is very little being offered by the sellers. What business was placed during the week for gravities above 24 generally brought from 2½ to 5 cents per barrel more than last week.

The heavy demand for furnace oil material has stiffened the kerosene market and the first of the week the 41-43 water white grade was bringing a low of 2 cents in Oklahoma. While several manufacturers report a slowing up in the demand for all bright stocks, steam refined stocks and neutral oils, prices are unchanged. The low cold test grades of bright stock and neutral oils are the most active.

Developments Favorable

Refiners who last week feared the results of the reopening of the flush fields in Oklahoma after a shutdown of over two months were encouraged by the developments of the past week. Although there have been some additions in crude oil runs to stills, the increases have not yet been sufficient to bring excess supplies of any product.

Only two of the half dozen plants in the Oklahoma City Pool have resumed operations and their products are not a factor except in the local Oklahoma market. The refineries which were shut down in East Texas, North and Central Texas the first of the month have not resumed operations and no change in this situation is expected over the remainder of the month.

Coastal Market

Market observers are basing their predictions covering additional advances in refinery markets on a continuance of curtailed refinery operations not only in the Mid-Continent but all competing areas in United States. Up to this time, the export and coastal domestic markets have not reflected the strength shown in the Mid-Continent gasoline and fuel oil. In fact, important reductions were made in both products during the past week. These coastal prices are now so low that there is no possibility of

(Continued on Page 104)

REFINED MARKET BAROMETER

Opposing price trends in important refinery products continued over the past week. Refinery gasolines, bunker fuel oils and Diesel oils were again reduced in East Coast states bringing these products to the lowest levels on record. At the same time refinery gasolines in the Mid-Continent and Middle West continued to advance. Fuels including furnace oils and gas oils were also strong in the latter areas and important price advances materialized. Kerosene was slightly stronger both in the Mid-Continent and Pennsylvania. Natural gasolines strong and prices on some grades advanced. No price changes of a general nature in bright stock and steam refined stocks. Wax prices reduced at East Coast plants.

Mid-Continent—Refinery gasolines strong and prices advance in all areas. Heavy demand for natural gasoline. Kerosene stronger and prices higher. Prices advanced in most grades of fuel oil, gas oil and distillate.

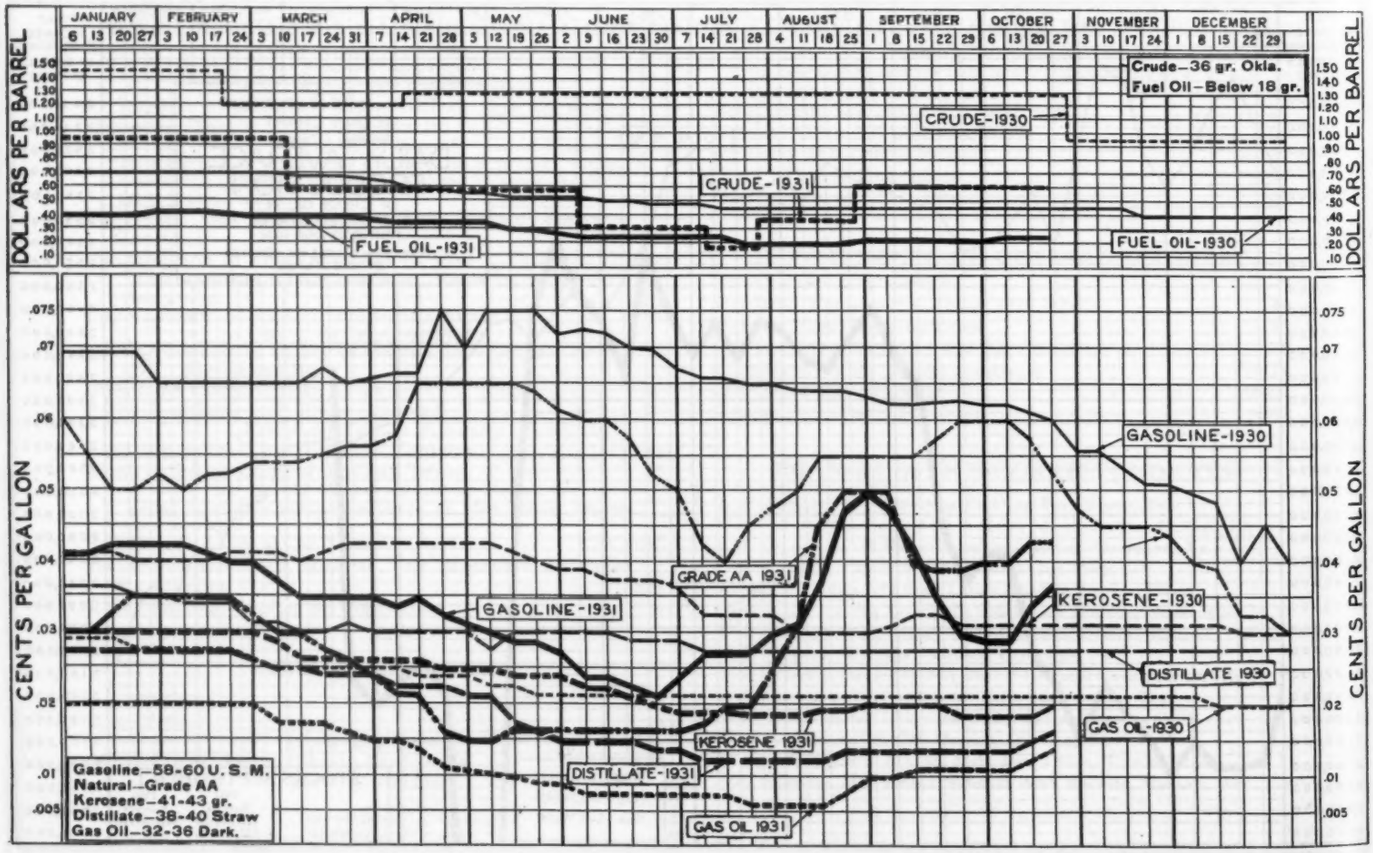
East Coast—Refinery gasoline prices reduced. Bunker fuel oil and Diesel oil prices lower. Better demand for gas oil. Increased demand for kerosene and prices firm. Slow export demand for all refined products.

Chicago—Gasoline prices higher with market giving more and more attention to antiknock ratings of motor fuels. Good movement of kerosene. Fuel oils and gas oils firm. Seasonal demand for furnace improves.

Pennsylvania—Some grades of domestic gasoline reduced. Kerosene market stronger. Mixed price trend in neutrals and cylinder stocks.

Gulf Coast—Refinery gasolines stronger. Fuel oil prices reduced. Other products unchanged.

California—Natural gasolines higher. Rumors of higher crude oil prices reflected in stronger refinery market for gasolines and fuel oils.



Gasoline Pipe Line Expansion Imminent

Successful Operation of Existing Lines Place Refiners Without This Means of Transportation at Disadvantage

By Andrew M. Rowley

A new era of pipe line construction seems ready to open for the petroleum industry. Discovery of the oil fields in West Texas and East Texas and the opening of prolific production in the greater Seminole area of Oklahoma resulted in a period of intense activity in the building of oil trunk pipe lines. Improvements in the manufacture of pipe and in welding, with the discovery of vast reserves of natural gas in the Texas Panhandle, the Hugoton area of southwestern Kansas and in Monroe and Richland Parishes in Louisiana brought the period of greatest activity in history of natural gas pipe lines.

Now the successful operation of gasoline pipe line systems promises to develop an era of gasoline pipe line building which may rival or surpass in point of mileage the oil and natural gas pipe lines which were built as the result of field discoveries and improvements in equipment mentioned above.

Until very recently the transportation of gasoline by pipe line was regarded quite generally as an experiment. The Shell Co. of California has operated successfully a comparatively short gasoline line in California for several years. The Midwest Refining Co. had a line from the Salt Creek Field to Casper. But long distance transportation of gasoline by pipe line from refineries to markets was really started just two years ago when the Standard Oil Co. (New Jersey) made a gasoline carrier of the old crude oil line across Pennsylvania owned and operated by the Tuscarora Pipe Line Co., a subsidiary.

Skeptical Until Recently

Despite the successful operation of the Tuscarora pipe line, the oil industry was still skeptical about operation of gasoline pipe lines. When the Barnsdall Oil Co. announced it would construct a gasoline pipe line from Oklahoma to Chicago, there were many oil company officials who threw up their hands in astonishment at such "foolhardiness." Dire predictions were made as to troubles which would be encountered; difficulties in design, construction and operation which could not be overcome; physical and mechanical problems which would prevent successful operation; the tying up of so much gasoline in the pipe line that the companies operating it would not have any left to sell; and that the cost of the line would be so great the companies owning it would never realize on their investment.

Other companies became associated with Barnsdall in the gasoline pipe line project with the result the Great Lakes Pipe Line Co. was formed with the following companies owning an interest: Continental Oil Co., Barnsdall Oil Corp., Mid-Continent Petroleum Corp., Pure Oil Co., Phillips Petroleum Co., and Skelly Oil Co.

The situation is changed entirely. The Great Lakes Pipe Line is in operation. During this month its schedule calls for the shipment of 750,000 bbls. of gasoline through the line—in other words, it is being operated at near capacity in October. No troubles or difficulties have been encountered which have not been solved and overcome quickly and thoroughly. The line is successful even beyond the hopes of its most ardent sponsors.

Records kept on the gasoline handled by this pipe line since the first barrel was placed into the line show losses from all causes—leakage, evaporation, theft, etc., have averaged less than 1 per cent. Crude oil pipe lines figure on a loss in volume of 3 per cent, yet the gasoline pipe line, carrying a far more volatile fluid, shows a loss of less than 1 per cent.

The Phillips Petroleum Co.'s gasoline pipe line from the Panhandle of Texas to St. Louis also shows a wonderful record for efficiency and volume of products carried.

Transportation Cost Low

Gasoline can be transported by pipe line for approximately half the freight rate charged by the railroads. Companies in the Mid-Continent area shipping gasoline by pipe lines in which they own an interest therefore can deliver their gasoline at the main consuming centers, such as the Chicago territory, for at least a cent a gallon less than their competitors who use tank cars for transportation. It is well known that large sales hinge to a great extent on the matter of price with an eighth of a cent a gallon often representing the difference between a profit and a loss.

Consequently, refiners with gasoline pipe lines for transportation enjoy so great an advantage over competitors forced to use tank cars that the latter companies realize they must have pipe line connections and affiliations for the transportation of their gasoline.

Hence the reason for the intense interest being displayed in many sections in gasoline pipe lines. Refiners who not more than one year ago ridiculed such means of transportation for gasoline are now believed to be making plans for the construction of lines from their refineries to principal marketing points.

Gasoline pipe lines are different from crude oil lines in that the maximum load is carried at the beginning of the line and the minimum load at the distant terminal. This is due to the fact bulk stations can be located along the line and distribution effected over a territory 100 miles wide along the pipe line—50 miles on each side—by means of tank trucks.

In a survey made by the Barnsdall Oil Co. when it was making plans for the construction of a gasoline line, it was found that the number of automobiles registered in the strip of country 100 miles wide along the line consumed each year five times the amount of gasoline the pipe line could transport. This did not include outside automobiles passing through this 100-mile strip of country.

Room for Many Lines

This fact shows many such gasoline pipe lines can be constructed without

(Continued on Page 102)

Laying an oil trunk pipe line from East Texas to the Gulf Coast.

Cleaning Old Wells Increases Earnings

Many Companies Have Found That the Application of Modern Cleaning Methods to Old Properties Reduces Production Costs

By L. G. E. Bignell
Petroleum Engineering Editor

With the opening of the closed-in wells in Oklahoma and maintenance of restricted production in East Texas there is a decidedly better tone in the petroleum industry. As the refining end of the business is rapidly getting its house in order there is every reason to hope for a marked and steady improvement in prices for crude oil and the finished products during the coming winter and spring.

Looking toward such improvements it behooves the production men to take advantage of the many engineering advancements so as to reduce lifting costs and be in position to profit from their operations.

At the Houston meeting of the A.I.M.E. last week there were several papers presented dealing with the many advantages of using tubing in wells. H. N. Marsh pointed out how wells in Santa Fe Springs, Calif., Field had been made to produce more oil and flow for a longer period by tubing the wells as soon as finished.

R. R. Hawkins, of The Texas Company, Tulsa, presented a paper on tapered tubing that indicates how it is possible, by selecting properly proportioned strings of small tubing to make old pumpers flow naturally. The Atlantic Oil Producing Co., Dallas, Tex., has been using small tapered strings in wells in the West Texas area with good success. Some strings are as small as one-quarter inch at the lower end and the company's investigations have indicated that this practice lowers production costs.

Used in East Texas

East Texas wells that have gone dead and have bottom hole pressures of 700 pounds are being made to flow by the use of bottom hole choke. Wells in that pool are tubed when finished and the christmas trees so designed that the gas-oil ratio and rate of production is controlled through flow beans.

The use of the Amerada pressure gauge for securing bottom hole pressures is becoming quite common practice in East Texas and many other fields and from the data obtained by this method many production problems are being solved. Knowing bottom hole pressure, volume of gas and oil, and the velocity of flow through the various size tubing it is possible to design flow strings that have high efficiencies.

Employing Engineers

There are a great many small leases in all parts of the country that could well have applied to their operation engineering methods of the approved type. In many instances the quantity of oil that the property can produce under any circumstances will be limited and not enough to permit the maintenance of resident engineers.

It should be possible, however, for engineering management companies to be formed in many districts and by taking charge of a number of properties reduce the consulting fee for each property to such an amount as to permit the owners to employ them either for special work or upon a yearly basis.

In many other industries consulting engineers are hired to make examinations of and report upon properties and it now seems that the time has arrived in the petroleum industry when more technical men should organize consulting engineering companies. The operators should welcome the opportunity to employ them to check conditions on their properties and make recommendations and, as they are accepted, to supervise the installation of such equipment as might be needed.

To indicate how such services will be profitable it is reported that one company operating in the Drumright, Okla., Field has recently had one of its old wells cleaned with sand pump and the production of oil was increased, when this work was completed, from 3 to 26 bbls. per day. In cleaning out this well a portable winch was used to supply power and about 30 feet of sand and shale cavings removed from the bottom of the hole with the results stated above.

This is now becoming a regular practice on the part of this company and others who use portable winch outfits, and it is possible that clean-out service companies could be organized to operate in many old fields where there are numerous small properties and the cost of maintaining such crews and equipment would be too great for the individual owners.

Clean-Out and Roustabout Crews

To indicate that such crews can be kept busy it is cited that in the East Texas oil field one teaming or hauling contractor who had trucks and other equipment has organized several clean-out and roustabout crews. Being centrally located in the field the oil companies are now calling his office by telephone and ordering out a crew to do any job on the lease.

This general idea can well be expanded to take in numerous other fields and as experienced oil field workers are available it should be possible to build up very efficient crews. The idea has long been applied to casing, rig and tank building crews and there should be no reason why it cannot be applied to roustabout and clean-out crews.

Having such crews available would also be of material aid to the engineering companies for they could then call upon them for the manual work that they recommend and would supervise. Without question such combinations would be beneficial to every one concerned and would aid materially in increasing the income of all.

It might seem that to do anything to increase the amount of oil produced at this time when prices are low would be unwise, but the wells under consideration are for the most part below 20 bbls. daily capacity, and a great many of them make around 1 bbl. per day. To increase the output from such wells is good business for in nearly all cases every expense incidental to production has been cut to the limit, so the only way the well owner can get any additional income is to increase the volume of oil produced. Small wells of this kind are not prorated and during the shut-down period in Oklahoma and Kansas they proved life savers for many of the refineries.

There is another kind of clean-out work that can be applied to old wells with good success if properly handled. Shooting to increase production is referred to, and in the Salt Creek Field of Wyoming where sand tamped shooting has been practiced for some time it has been found that wells that averaged but 6.4 bbls. per day before shooting made an average of over 68 bbls. after shooting. This record covers more than 100 wells and has been so uniformly successful that it is now regular practice in that field.

Fluid vs. Sand Tamping

In the Salt Creek, Wyoming, oil field it has long been common practice to shoot wells, but fluid stemming has been used, until the sand stemming method was developed and proven. Many of the wells referred to in the previous para-

(Continued on Page 81)

Martial Law Needed in East Texas

General Wolters Explains Situation. Governor Firm in Maintaining Control Despite Appeal to Federal Court

AUSTIN, Tex., Oct. 19.—Governor Ross S. Sterling retains military control of East Texas notwithstanding the temporary injunction restraining the Railroad Commission, Attorney General Allred, General Jacob F. Wolters, B. McDavid and A. B. Capers from prorating producing wells of Eugene Constantin, J. D. Wrather and Brock-Lee Oil Co. in East Texas granted in Federal District Court at Tyler by Judge Randolph Bryant of Sherman.

Circuit Judge J. H. Hutchinson of Houston will sit with Judge Bryant and another United States district judge to hear the case at Beaumont, October 29.

Legal Points Raised

Lawyers who have expressed themselves are of opinion that the chief point will be the question of jurisdiction. It is pointed out that the Supreme Court has held that production of minerals is not interstate commerce, even though they may finally move into interstate commerce. If the production of oil is not interstate commerce the chief reason for Federal Court's review of any restraint by the State is taken away.

Another point will arise through alleged deprivation of property aside from due process of law, or without compensation. On this point the plaintiffs will have to show that orders designed to insure equitable withdrawals of a common possession by various owners really constitutes a deprivation.

Since General Wolters is named, the question of martial law will also figure. On this point, the lawyers cite, it has been held by the courts that the decision as to the necessity of martial law is purely a province of the executive branch of the Government, and that the judicial branch has no right to pass on the adequacy of the reasons behind the executive's proclamation.

A fourth point will be the reasonableness of the exercise of police power of the State in regulating production of oil to prevent waste. In this connection, lawyers cite a long list of cases in recent years in which the police power of the State has been almost uniformly upheld. A case believed near in point is that in which "Rule 37" of the Texas Railroad Commission, specifying the distances from property lines where a well might be drilled. It is declared that if the higher courts found that it is reasonable exercise of the State's police power to tell a landowner where on his land he may drill a well, to prevent damage of his neighbors' property, it will probably be held reasonable to tell him what rate of production he may be allowed, to the same end of preventing damage to the property of neighbors.

Plaintiffs' Petition

The petition presented to the court stated the plaintiffs, were suffering irreparable damages of at least $1,500 daily; that House Bill 25 passed by the Forty-second Legislature gave the commission power to curb only physical waste and explicity prohibited the body from curbing economical output or adjusting the supply of wells to the current market.

The plaintiffs said that by taking 5,000 bbls. daily from their wells, no adjacent property would be damaged in any way. They further stated that should conditions existing be allowed to continue their property would be in danger of irreparable loss from faultily drilled wells in the vicinity.

The plaintiffs stated that the daily loss they suffered made it impossible to drill other wells which they would have been able to drill and operate and that there was no adequate recourse to law which could restore their losses.

The plaintiffs' petition charges that the powers of the commission are in contravention of the Constitution of the United States. Article 1, Section 10 which prohibits a state from passing an act impairing the obligation of contracts, and Section 1 of the Fourteenth Amendment which prohibits a state from passing a law depriving persons of liberty and property without due process of law.

The plaintiffs state further that House Bill No. 25 is so uncertain, indefinite and ambiguous as to render it unconstitutional. They charge that the system of prorating oil on a ratio of gas is unsound in that few wells have an equal ratio.

It was stated that the plaintiffs had a ready market for at least 5,000 bbls. of oil daily and that failure to supply this amount would mean that the refinery would continue to stand comparatively idle.

Governor's Orders

After the Federal Court injunction was granted Governor Sterling hastily embodied the Railroad Commission schedule in a military order, lest the injunction interfere with his determination to see production in the field kept on an orderly basis.

The order to General Wolters follows:

Whereas, by Proclamation No. 9447, dated August 16, 1931, you were directed to "assume military command in the territory affected (in the counties of Gregg, Rusk and Smith in the State of Texas), and without delay to shut down each and every producing oil well and/or producing well of natural gas, and to further take such steps as he (you) deem necessary to enforce and uphold the majesty of the law subject to the orders of the governor of Texas and commander-in-chief of the military forces of this State as given through the adjutant general," and

Whereas, according to reliable information presented to me by many responsible citizens, the organized and entrenched group of crude petroleum oil and

(Continued on Page 99)

Cam Bloom Drilled Two Famous Wells

One Was the No. 1 Norman, Which Opened the Kansas Oil Fields, and the Other Is the Oldest Producing Well in Oklahoma

By Thomas F. Smiley

Along with the other things that have crammed a busy life, Cam Bloom drilled two famous wells, one the No. 1 Norman, on the eastern edge of Neodesha, Kans., the first commercial oil well in the Mid-Continent area; the other the Cudahy Oil Co. well at the north end of the Big Caney River bridge in Bartlesville, Okla., the oldest well in the State in point of productive life.

That was about 40 years ago. Today Cam Bloom, 63, and residing in Independence, Kans., is strong and active. In the early days, when fishing tools were crude and scarce, he had to devise his own methods of overcoming difficulties encountered in drilling wells. Long experience made him resourceful, so that now he is in demand as a specialist in hard fishing jobs and well troubles.

Few of Cam Bloom's friends — and there are hundreds of them—could tell you what his Christian name is. To them he is and always has been simply "Cam." So occasion is taken here and now to say that the name is Camdon.

Camdon L. Bloom was born in 1868 near Curwensville, Clearfield County, Pennsylvania. His father, Amos W. Bloom, was a pilot in the old-time rafting operations on the Susquehanna River. Migrations of the family took it to Indiana, Missouri and eventually to Linn County, Kansas, where at the age of 17 Cam began working as a tool-dresser in the drilling of water wells, which were a necessity in that region. Up to that time Cam's work had been on farms or in lumber camps. Of school there had been virtually none. The education which enabled him later on to handle large business transactions and to take his place among men who had received cultural advantages denied him was acquired by hard work, hard knocks and by hard study after the whistle had blown.

Water-Well Drillers Begin Hunt for Gas

Advancement from tool-dresser to driller came soon. There was little to indicate that these men who in the early eighties were engaged in the uneventful vocation of drilling water wells would be devoting all their energies soon to an exciting hunt for oil and gas. Much of the water-well drilling was in the neighborhood of Paola, Miami County, Kansas. Frequently the drillers struck small flows of gas and minor showings of oil. In 1882 gas in commercial quantity was found near Paola and from that time on the search for gas became increasingly active. More and more water-well drillers turned to drilling for gas.

In 1887 Mr. Bloom and A. P. McBride formed a partnership to do contract drilling. At first they drilled for water, but in 1888 they began drilling for gas. In these early water-well and gas-well operations Mr. Bloom was accumulating knowledge of underground conditions that was a valuable preliminary to the complex problems of deep-well drilling in after years. Through his aptitude in determining the sources of underground trouble in drilling and producing operations he was able greatly to increase the business of the Coffeyville (Kans.) Gas Co., owned by W. P. Brown, a merchant of Coffeyville, and to acquire an interest in the company. The company was getting from its wells, all near town, scarcely enough gas to supply the business district, without attempting to extend its service to homes. Even these few consumers were obliged to turn to other fuel at times because of water, produced with the gas, getting into the lines. The worried Mr. Brown called Cam Bloom into consultation.

"There's no water in the gas sand," said Cam after looking things over. "These wells haven't been cased right."

"Well, can you case them right and can you stop that water from getting into the gas lines?"

"Sure," was the confident reply.

"Do it and you can have a half interest in the company."

Then Things Began to Look Up

And so it came about that McBride & Bloom, the first Mid-Continent oil and gas contractors, became half owners of the Coffeyville Gas Co., an interest which they retained for several years. Cam stopped the water intrusion in each of the gas wells and then drilled them deeper, increasing the recovery of gas to such an extent that the Coffeyville system was enlarged to take in the residence districts in addition to the business houses already served. The biggest gas well in Kansas at that time, producing 4,000,000 feet daily, was obtained by drilling one of the old wells 250 feet deeper.

Meanwhile Cam and his partner were drilling wells around Paola for W. M. Mills, pioneer oil and gas operator in Kansas, who had obtained a franchise to supply the town of Osawatomie with gas, but was not getting enough of it from his wells to meet the demands of consumers.

In 1892 McBride & Bloom drilled for Mr. Mills the No. 1 Norman, at the eastern edge of Neodesha on the Verdigris River, in an attempt to find gas for that city. One night while he was handling the tools Cam saw the hole was filling with oil. He shut in the well at once. The Mills interest was purchased soon afterward by Guffey & Galey, of Pittsburgh, Pa., who shot the well. It started off at 371 bbls. a day, dropping soon to 12. It took its place in petroleum history as the discovery well of the Mid-Continent territory, for it ushered in all those wide-flung prospecting, leasing and drilling operations that were to open up Eldorado, Spindletop, Seminole, East Texas and the other famous Mid-Continent oil pools. Plans are under way to mark the site with a monument.

It was five years later that Mr. Bloom drilled for the Cudahy Oil Co. in Bartlesville, Okla. (then Indian Territory), the well that was to achieve fame as the oldest producer in the state. Michael Cudahy, meat packer of Chicago and Omaha, was head of this company. He already was interested in eastern oil operations and later was to play an important part in Mid-Continent development. Mr. Cudahy gave the drilling contract for the Bartlesville well to McBride & Bloom, who previously had drilled two wells for him in the town of Muskogee, Okla. A small quantity of amber oil was found in each of the Muskogee wells, but both were shut in as not worth operating. Years afterward these same wells were shot and put on profitable production.

How It Was Done in Those Days

The Bartlesville well was located on the west bank of the Big Caney, at the ferry-boat landing. The rig for the drilling job had to be transported 65 miles across country from Red Fork, Okla., then a trading post about 5 miles southwest of the present city of Tulsa. Mr. Bloom was in direct charge of the work. There were only rough wagon trails instead of roads, and there was no bridge spanning the Arkansas River, which had to be forded near Tulsa.

Three weeks was consumed in effecting a transfer of equipment which today would require about that many hours. There were 26 wagons in the train, all drawn by horses or mules with the exception of the heaviest load, made up of the mudsills and a big bandwheel, and this was hauled by three yoke of oxen. Thirty men were employed. It was January, 1897, and freezing weather had been followed by a thaw, with the result that the horses and mules frequently were stuck in thick, deep mud. Here the stolid oxen saved the day. They were unhitched from their own load and attached to the mired one. When their united strength was exerted under the stimulus of a goad and a flow of vigorous language from the driver, the wagon soon was wrenched from the grip of the bog. Progress was so slow that sometimes the same spot served as a camp site for two nights in succession. Later years saw good wells drilled along the very route over which Cam Bloom and his outfit crept toilsomely on their way to Bartlesville to drill the first well for oil there.

The Cudahy well on the Big Caney, drilled to a depth of 1,400 feet, came in flowing about 150 bbls. a day and it continued to produce 25 to 50 bbls. natural, the first well of such proportions in the state. It is still on the jack and it is pointed out to tourists driving through the park in Bartlesville over the United States highway No. 75. A permanent marker at the site is under consideration.

Among exciting incidents that marked the three weeks' journey of Cam Bloom's wagon train from Red Fork to Bartlesville was one at the Arkansas River, which was covered with softening ice. Cam sent men with saws and axes to cut a channel. This completed, the fording of the stream, a hazardous undertaking, began. Each two-horse wagon team was supplemented by two other teams in making the crossing. This precaution was taken not only for the additional horsepower it provided, but so that if any one of the six horses should get stuck in the quicksand-like bed of the river the others might pull it out.

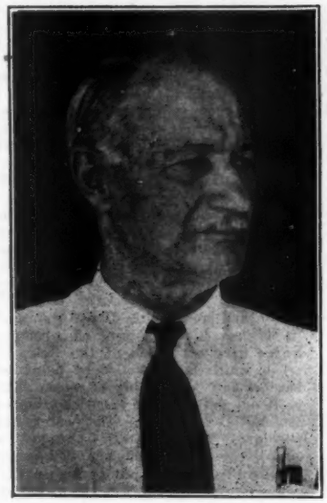
Help at Last

On the north bank of the Arkansas the men found a half-dozen covered wagons, or "prairie schooners," occupied by shivering families working their way to points farther south and halted here by the treacherous ice. Cam took pity on their predicament. As each of his six-horse teams arrived on the north bank with its wagonload of drilling equipment it was hitched to one of the covered wagons, which then was taken across the river in the channel cut through the ice.

(Continued on Page 99)

AND THERE WAS OIL RIGHT UNDER THEM

Cam Bloom laughs grimly when he refers to it now. There he was, back in 1897, floundering through slush and mud, with a train of 26 wagons and trucks, powered by horses, mules and oxen, struggling to transport drilling equipment from Red Fork to Bartlesville, in Oklahoma. Only 65 miles, but it took three slime-splashed, back-wrenching profanity-strewn weeks.



Camdon L. Bloom

They wanted the rig in Bartlesville to drill for oil there. If only they had known it, there was oil right under the very trail over which the wagon train slipped and sloshed and sank into bottomless ooze. A well put down almost anywhere, subsequent tests showed, would have been a producer.

Just one of the fantastic jokes of which oil prospectors from the beginning have been victims. The story of petroleum is peppered with instances of pools passed over day after day by prospectors bent on exploring good-looking areas somewhere else.

There was Tonkawa, in Noble and Kay Counties, Oklahoma. Numerous pools had been developed in Kay County from 1913 to 1917, and then the Garber field in Garfield County was opened. But not until 1921 was the Tonkawa pool discovered snuggling between the Garber production and the cluster of pools in Kay County. And Tonkawa has yielded more oil than all the other pools in Kay and Garfield Counties combined.

The East Texas field, in Rusk, Gregg and Smith Counties, affords another instance of drilling all around an unsuspected oil pool. The discovery well in Texas was drilled in Nacogdoches County, just south of Rusk County, 42 years ago. Other tests were drilled in all directions from it, resulting in the opening of the North Louisiana and Corsicana fields, both far from Nacogdoches. A dozen pools found in the course of this prospecting were developed, reached their peak and began their decline before Dad Joiner, acting on a hunch, put down the well that opened the biggest oil field in this country's history. And it was just a few miles from the spot where the state's discovery well had been drilled in 1889.

Forty Fields Produced Half the Oil

Combined Productive Acreage of America's Leading Oil Fields Only 59 Per Cent of the Area of Rhode Island

By James McIntyre

The total production of the United States from the fall of 1859 down to June 30, 1931, was approximately 13,567,987,000 bbls. Of this, 40 oil fields have produced 7,112,443,784 bbls., or more than one-half. The 40 fields consist of 469,447 acres of oil "pay." The productive parts of all the 40 fields, producing more than half of the nation's production, could be put into a space 27 miles square. The smallest state in the Union is Rhode Island, consisting of 1,248 square miles. The 40 largest oil fields in the Union would occupy only 59 per cent of the area covered by the tiny State of Rhode Island. Immediately this brings to mind the unusual size of the East Texas oil field with its productive parts estimated all the way from 90,000 to 120,000 acres. Assuming that it is 90,000 acres in extent, the country's latest big field covers nearly one-fifth of the area covered by the 40 largest producing fields.

The 40 largest fields range in productive acreage all the way from 452 acres in Spindletop, Texas, up to 85,000 acres in Bradford, Pennsylvania. They have produced all the way from 62,857,318 bbls. from the Lost Hills-Belridge Field in California up to 702,573,003 bbls. for Midway-Sunset in California. They have averaged in production per acre all the way from 3,460 bbls. in Bradford up to 264,124 bbls. in Long Beach, California. Some of the big fields are single pools; others are groups of pools, like the Seminole Field in Oklahoma and the Augusta-Eldorado Field in Kansas.

East Texas Now Among Leaders

If the production of the greatest fields were brought up to date, the East Texas Field would have to be included among them even though it has produced only one year, for East Texas has produced over 75,000,000 bbls. of oil up to this time, and its potential production is only limited by the pipe line and tank car outlet. It has produced over 1,250,000 bbls. in a single day, at an average of 700 bbls. per well, with many of the wells choked down.

However, this is not a story of East Texas. That field had not yet poured out enough crude oil up to June 30 to get into the big field picture. When the big field table is again made up with December 31, 1931, as the closing date, it will appear prominently. By that time it may have produced more than the Powell Field has in eight years.

Still an Important Factor

The 40 largest fields in the United States have made oil history ever since 1875. Each of them was a leader in its day; received much publicity; was the scene of busy drilling operations, storage tank building and pipe line construction. Some of them have faded out of prominence and are but memories. Chief interest in them now lies in what they produced per acre as a guide to the possibilities of fields of today and the future with similar sand characteristics. At the same time it may be said that the 40 fields in question were yet producing 42 per cent of all the oil produced in the country on June 30 of this year, indicating the very great importance of some of them even in the present day.

Most of the great fields warrant special mention because of one or another peculiarity or some outstanding fact relative to their discovery or development.

The Bradford Field

The Bradford Field, which lies mainly in McKean County, Pennsylvania, but the north end of which extends a few miles into Cattaraugus County, New York, was opened to commercial production in 1875, although oil had been discovered on the New York side of the field years before that, and drilling had been going on intermittently since the early sixties. Ignorance of subsurface conditions, and lack of suitable drilling equipment were responsible for the abandonment of numerous tests at depths too shallow to have uncovered any oil sands in most of the wells that were drilled between the early sixties and 1875, but when the Bradford sand was reached by Jackson & Walker and a well of commercial importance brought in, the field was at once made the Mecca of oil men who had been drilling in the fields of Venango, Warren, Clarion, Forest and Butler Counties, and by 1881 over 15,000 oil wells had been drilled and the field brought to a production estimated at 100,000 bbls. a day at its peak. Eighty-five thousand acres of proven sand has been developed on the 105,000-acre structure and within the proven territory dry holes have in the last 56 years been so rare as to have been negligible.

Beginning of the "Flood"

About 20 years ago, when the field had declined to a low level of 2,600 bbls. per day, producers in various parts of the field began to notice that their wells were increasing in oil production, and in time that the wells began to produce an increasing volume of water along with the increased oil output. Alarmed at the water intrusion, many of these owners sold their properties to less fearful oil producers or turned them over to their pumpers on a long-time payment basis.

The presence of water was found to be caused by inefficient plugging of abandoned oil wells near producing wells, permitting ground water to fill the abandoned holes, resulting in a pressure of from 600 to 900 pounds per square inch against the face of the sand. In the course of time this water under pressure penetrated the sand and drove the dormant oil ahead of it, which oil found its way to the nearest oil wells, multiplying the production of the wells as much, in some cases, as 10 times.

With the cause of the "flood" made known, some operators began the surreptitious artificial flooding of leases by the simple proceeding of lifting the casing in one well and permitting ground water to enter the shot hole. This was against the law, so producers sought and procured legislation to legalize the "restoration of pressure" in the oil sand in the Bradford Field. With the law back of them, Bradford producers began to freely make use of water pressure by drilling additional wells and using them as water-intake wells, and to improve the method of flooding the sands. This brought engineers and geologists into the field and science took the place of haphazard measures. Coring became common, core samples were put in the hands of the geologist and physicist for analysis. Scientific well spacing, for the purpose of getting the best results out of the action and trend of the flood, was applied to leases. Co-operation of owners of leases in given parts of the field, in a sense, unitized properties by using lease borders for the drilling of water intake, or flood, wells. Then came the improved system of introducing the water under pressure. To the static pressure was added the power of big compressors, which in some cases put as high as 1,500 pounds pressure against the sand, thus hurrying the progress of the water through the sand and greatly increasing the recovery of oil. Five spotting was introduced, with the oil well as the five spot, fed with water by four water intake wells equipped with powerful compressors to increase the pressure. Wells that naturally would produce a quarter of a barrel a day produce from 4 to 40 times that quantity under such pressure.

The field went from about 2,600 bbls. a day up to 33,000 bbls. a day, with only a very small percentage of the total acreage under flood. The field could as easily produce 75,000 bbls. a day. All it would require would be an increase in flooding operations sufficient to bring the production up to that figure, and in the opinion of Bradford operators it could produce 75,000 bbls. a day over a period of 10 years.

Good for Many Years

The Bradford sand is very fine and very closely cemented. It has a recoverable content of over 10,000 bbls. per acre. Of this, only 3,460 bbls. has been extracted. It is regarded as an 850,000,000-bbl. field, some estimates placing the ultimate recovery much higher than that. The oil is regarded in Bradford as the best lubricating stock in the country and commands, along with the oil produced in its neighbor, the Allegany Field, the highest price of any oil in the United States. The Allegany Field and the Bradford Field are the only large fields that have been successfully repressured with water. The character of the sand makes them peculiarly adaptable to this method of repressuring, although air and gas have been used with some success in the two fields. The pay lies at from 1,100 feet to 1,600 feet in depth, depending upon the surface elevation. The average would be around 1,230 feet in depth. The field has been under proration since last April and is now permitted to produce only 29,000 bbls. per day. The oil is green in color and about 42 degrees in average gravity with a paraffin base.

The Burbank Field in Osage and Kay

Continued on Page 106)

RECORD OF THE LEADING PRODUCING FIELDS OF THE UNITED STATES

(From their beginning up to June 30, 1931)

		Total prod. up to June 30, 1931	Productive acreage	Av. prod. per acre	Dly. prod. June 30, 1931	Gravity of oil
1901	Midway-Sunset, California	702,573,003	41,000	17,136	48,500	23.5
1925	Seminole Field, Oklahoma	444,352,095	24,200	18,362	116,300	38.0
1921	Long Beach, California	435,803,554	1,650	264,124	75,200	27.0
1921	Santa Fe Springs, California	318,583,366	1,650	193,081	62,200	30.0
1896	Coalinga, California	317,717,005	16,480	19,279	8,600	16.5
1922	Smackover, Arkansas	312,552,835	26,080	11,985	33,350	24.0
1912	Cushing, Oklahoma	303,765,722	21,850	13,905	12,950	37.0
1875	Bradford, Pennsylvania	294,141,130	85,000	3,460	21,950	44.0
1900	Kern River, California	284,533,339	8,100	35,128	10,600	15.0
1916	Augusta-Eldorado, Kansas	240,611,201	24,900	9,663	21,500	34.0
1889	Salt Creek, Wyoming	232,161,783	20,480	11,336	24,800	36.0
1906	Glenn Pool, Oklahoma	195,825,173	19,050	10,279	6,200	32.0
1920	Huntington Beach, California	177,602,290	2,750	64,583	18,300	24.0
1920	Burbank, Oklahoma	177,516,641	21,420	8,287	13,150	38.0
1913	Healdton, Oklahoma	164,307,275	7,340	22,385	11,450	30.0
1926	Hendricks, Texas	146,916,652	11,000	13,356	41,200	30.0
1897	Fullerton, California	139,089,249	1,750	79,479	9,720	22.0
1919	Burkburnett, Texas	137,713,414	18,400	7,484	6,550	39.0
1906	Caddo, Louisiana	135,590,423	32,480	4,175	9,750	38.0
1902	Santa Maria, California	126,748,326	8,000	15,757	3,180	12-25
1912	Coyote, California	126,058,772	2,100	60,028	10,000	15-30
1926	Yates, Texas	123,125,969	16,960	7,433	70,700	30.0
1919	Elk Hills, California	117,298,148	4,879	24,041	13,625	22.0
1902	Spindletop, Texas	116,096,613	452	256,984	8,050	19.0
1905	Humble, Texas	111,624,925	2,350	47,500	8,500	19.0
1916	Ventura Avenue, California	109,119,195	1,750	62,354	39,900	29.0
1922	Tonkawa, Oklahoma	108,510,295	3,420	31,728	5,650	43.0
1921	Mexia, Texas	103,370,134	3,705	27,900	3,500	37.0
1923	Powell, Texas	96,007,159	2,612	36,756	4,000	37.0
1917	Montebello, California	87,781,413	1,105	79,440	6,600	22.0
1926	Church-Fields-McElroy, Texas	87,407,922	11,840	7,382	20,050	31.0
1898	McKittrick, California	81,033,638	2,050	39,528	9,850	28.0
1900	Inglewood, California	77,223,744	900	85,804	14,200	20.0
1904	Sour Lake, Texas	74,945,455	7,028	72,257	1,800	20.0
1917	West Columbia, Texas	70,823,821	455	155,877	4,100	20.0
1922	Torrance, California	69,445,503	4,500	15,432	5,750	20.0
1920	Goose Creek, Texas	69,133,247	900	76,815	4,250	20.0
1928	Oklahoma City, Oklahoma	67,960,925	8,110	8,380	214,450	38.0
1927	St. Louis, Oklahoma	64,415,112	5,200	12,388	20,400	38.0
1910	Lost Hills-Belridge, California	62,857,318	4,550	13,815	9,860	19.0
	Total	7,112,443,784	469,447	15,151	1,030,685	28.8

A. G. A. Endorses the Five Year Plan

Next Annual Meeting Will Be Held at Atlantic City October 10, 1932. Closing Session of Convention Attracts Capacity Audience

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

ATLANTIC CITY, N. J., Oct. 19.—Resolutions endorsing the new "Five-Year Plan" for the conduct of the operations of the gas industry of America, expressing confidence in the continued stability of the gas industry, and endorsing the enterprise of equipment and appliance manufacturers connected with the gas industry were adopted at the closing session of the thirteenth annual convention of the American Gas Association here.

While there had been some sentiment in favor of holding the 1932 convention of the association in some other city, Boston being prominently mentioned in this connection, the members voted at their closing session to return again to Atlantic City, the convention and exhibit being scheduled for the week of October 10 next year.

The resolutions adopted follow:

"Believing that the five-year program of association activities, adopted in 1926, has guided the industry well and served to concentrate our energies in the directions most essential to our progress, the American Gas Association in convention assembled heartily approves the new program prepared by the executive board for the succeeding five-year period.

"The American Gas Association again finds cause for gratification at the stability and adaptability of the gas industry of the United States and Canada, maintaining through a difficult period its service to the public, the soundness of its securities, the relative absence of unemployment, and expresses confidence in its future as an essential American industry.

"Our exhibitors at the thirteenth annual convention of the association have given the industry a vote of confidence, and have demonstrated their ability and purpose to produce and develop appliances and equipment for public use unsurpassed anywhere in efficiency or beauty, and the association hereby expresses its appreciation of their achievements and its confidence in our manufacturers.

"The association especially recognizes what our manufacturers have done by putting on the most comprehensive and most attractive exhibition ever seen anywhere. It is indeed refreshing to see, in these trying times, such a manifestation of the courage our associates have shown."

Closing Session

The closing session of the general meeting attracted a capacity audience, the addresses of Dr. Zay Jeffries, consulting metallurgist for the Aluminum Co. of America; Judge H. O. Caster, general counsel for Henry L. Doherty & Co., and B. C. Forbes, financial writer, having attracted considerable interest. Judge Caster's paper, in particular, presenting a graphic and comprehensive picture of the present situation in the natural gas industry, aroused widespread interest and discussion. While natural gas did not entirely hold the spotlight at this year's convention, as was the case in 1930, there was a general belief that some of the present difficulties of the industry are but temporary, traceable to present unsettled economic conditions, and that the present lull in the industry will prove but temporary, after which natural gas expansion may be expected to again go forward with renewed vigor.

While delegates to the convention were slow in arriving for this year's meeting, the registration list rose steadily as the week progressed and by the close of the meeting there were approximately 5,000 registrations. This was greatly in excess of earlier indications, which had placed the probable attendance at not over 3,500, and the 1931 meeting, in the final analysis, compared favorably with the record 1930 convention from the standpoint of attendance.

Considerable interest was manifest throughout the convention in the progress of the research and development work in house cooling and summer air conditioning, which the Committee on Industrial Research has been conducting, and which culminated in field tests during the summer just ended. The committee has been actively working in perfecting the silica gel process with considerable initial success. Two of the test installations sponsored by the association's committee have been in steady operation during the past summer, and the experience and operating data gained from these installations is now being co-related and will be made available to the entire industry.

A.G.A. Plan

The American gas industry, although reflecting current economic conditions, has shown less decline in volume of sales than most other basic industries, declared Clifford E. Paige, vice president of the Brooklyn Union Gas Co., and retiring president of the A.G.A., in his remarks at the opening of the general sessions. This, he added, has been due in large measure to the careful preparation for all contingencies provided for in the first "A.G.A. Plan," developed in 1926.

This "A.G.A. Plan," which is the American gas industry's five-year plan, antedated the Soviet's famous five-year plan by a matter of two years, Mr. Paige stated, having been originally formulated in 1926, at which time the gas industry of the country adopted a definite plan of operations as prepared by a committee of the industry's leaders, under the chairmanship of George B. Cortelyou, president of the Consolidated Gas Co. of New York.

This plan has been carefully adhered to by the association during the past five years, and its success has been such that the convention at its initial session this year unanimously approved a new "five year plan," to succeed the original program and to govern the next five years of the association's activities. The new program was prepared by a committee headed by D. D. Barnum, president of the Boston Consolidated Gas Co., and takes into consideration the changed conditions within the industry.

Outlining the activities of the gas in-

(Continued on Page 100)

Conservation of Natural Gas Essential

Two Billion Dollars Now Invested in Natural Gas Industry. Government Protection of Reserves Recommended

By Judge H. O. Caster
General Counsel, Henry L. Doherty & Co.*

It is estimated that there are $2,000,000,000 invested in the natural gas industry in the United States, that there are 55,000 gas wells, 72,000 miles of main and gathering lines, and 50,000 miles of distributing mains serving a population of 22,000,000. There were 20 per cent more customers in 1930 than in 1928, and the investment in natural gas properties has almost doubled in the past five years. This very rapid increase in the number of customers and in the amount of investment is due, primarily, to the discovery and development of four or five major gas fields and a great number of smaller ones.

The increase in the knowledge of discovering oil has led to its great overproduction and, at the same time, to a very great overproduction of gas. This increase of knowledge may lead to the early discovery of all the principal oil and gas pools or fields in our country and, consequently, lead to a much earlier exhaustion of our gas and petroleum resources.

Much of the oil and gas now produced is being sold at less than the cost of production. Undoubtedly, there is a sufficient quantity of natural gas to serve the pipe lines now built, and the markets now served, during our generation. Nevertheless, it behooves our government to protect our vanishing natural resources for the longest possible period of time for future generations.

Reserves by Fields

The reserves of some of the principal fields are estimated as follows:

Panhandle (Texas) — Open flow, 12,254,000,000 feet; reserve gas, 10,312,000,000,000 feet; gas produced to date, 1,000,000,000,000 feet; productive and proven acreage, 1,289,000 acres; number of wells (gas), 650; reported wastage per day, 500,000,000 feet.

California (State)—Open flow, 1,100,000,000 feet; reserve gas, 7,000,000,000,000 feet; productive and proven acreage, 75,000 acres. Kettleman Hills — Open flow, 250,000,000 feet; reserve gas, 5,000,000,000,000 feet.

Hugoton (Kansas and Oklahoma)—Open flow, 800,000,000 feet; reserve gas, 6,000,000,000,000 feet; gas produced to date, small amount; productive and proven acreage, 1,000,000 acres; number of wells (gas), 150.

Monroe (Louisiana)—Open flow, 4,435,000,000 feet; reserve gas, 2,712,000,000,000 feet; gas produced to date, 1,400,000,000,000 feet; productive and proven acreage, 250,000 acres; number of wells (gas), 850.

Southeastern New Mexico Gas Area—Open flow, 367,000,000 feet; reserve gas, 1,521,000,000,000 feet; gas produced to date, small amount; productive and proven acreage, 100,000 acres; number of wells (oil and gas), 160.

Southwestern Wyoming Gas Area—Open flow, 683,000,000 feet; reserve gas, 560,000,000,000 feet.

South Central Kansas Gas Area—Open flow, 971,000,000 feet; reserve gas, 280,000,000,000 feet; number of fields in area, 15; productive and proven acreage, 15,000 acres; number of wells (oil and gas), 125.

Oklahoma City—Open flow, very large; reserve gas, 253,000,000,000 feet; gas production greatly affected by oil production; productive and proven acreage, 16,300 acres; number of wells (oil and gas), 750.

Central Wyoming Gas Area — Open flow, 744,000,000 feet; reserve gas, 200,000,000,000 feet; number of fields in area, 11.

Tioga (Pennsylvania)—Open flow, 404,000,000 feet; reserve gas, 100,000,000,000 feet; gas produced to date, small amount; productive and proven acreage, 4,500 acres; number of wells (gas), 21.

Jackson (Mississippi) — Open flow, 1,134,000,000 feet; reserve gas, 25,000,000,000 feet; gas produced to date, small amount; productive and proven acreage, 3,200 acres; number of wells (gas), 50.

Wayne-Tyrone (New York) — Open flow, 286,000,000 feet; reserve gas, 16,500,000,000 feet; gas produced to date, small amount; productive and proven acreage, 5,500,000 acres; number of wells (gas), 76.

Thirty Trillion Feet

The estimate of the reserves of these fields is approximately 30,000,000,000,000 feet.

In such fields as the Panhandle (Texas) and the Hugoton (Kansas) gas is found in a lime and granite wash formation. The cores of these sands show that in the lime the porosity varies all the way from cavities as large as marbles to a rock so dense that gas cannot permeate it. How much of this lime formation in the field is saturated cannot be accurately determined, nor can its porosity be accurately estimated. The quantity of gas in the sands and in these formations depends upon the area of the field, the porosity, the thickness of the sand, and the well pressures. These vary greatly in different pools. In the Panhandle the initial pressure ranges from 430 to 470 pounds, while at Oklahoma City the well pressure is almost 2,000 pounds. The Hugoton, Kans., area has the same general sand formation as the Panhandle, Tex., Field. However, the initial open flow of wells in the Hugoton Field is only about one-fourth of that of the wells in the Panhandle Field. The reason for this diference is generally ascribed to the difference in the porosity or density of the sand.

Some gas fields consist of a series of pools, while others cover a large and continuous area. It is generally thought that the Panhandle Field, consisting of more than 1,250,000 acres, is one great pool. While the largest estimated production per acre is 15,000,000 feet, there are a number of wells which have produced more than 3,000,000,000 feet, which indicates that the gas travels considerable distances through the sand.

The life of these pools and the amount of gas that can be recovered and marketed depends, of course, upon the amount of gas in the sands, but it depends to a large degree upon how much of this gas can be conserved for the markets and how much of it is allowed to be wasted. At the present time in many of the principal fields, such as the Panhandle, more gas is blowing in the air than is being taken out and used.

Expanding Transportation

The production of these great quantities of gas in the various fields led to its transportation and sale in all of the available near-by markets. Pipe lines were originally thought to be the limit

(Continued on Page 83)

*Before American Gas Association Convention, Atlantic City, N. J.

Request Right to Control Production

United States Chamber of Commerce to Vote on Recommendation to Allow Oil, Coal and Lumber Industries to Curtail Output

Matthew S. Sloan, chairman of the Natural Resources Production Department Committee of the U. S. Chamber of Commerce, has made public the following report of the committee which has been sent to referendum vote of the membership of the chamber by direction of the board of directors:

The cumulative experience of the oil, coal and lumber industries has brought them to a point where they agree that they cannot go on under the old and present conditions—that there must be a new charter for their conduct if they are to be successfully carried on in their own and in the public interest.

This is not the opinion of the industries alone. In his last message to Congress, President Hoover said, concerning the problems confronting the natural resources industries:

"The people have a vital interest in the conservation of their natural resources; in the prevention of wasteful practices; in conditions of destructive competition which may impoverish the producer and the wage earner; and they have an equal interest in maintaining adequate competition. I therefore suggest that an inquiry be directed especially to the effect of the workings of the anti-trust laws in these particular fields to determine if these evils can be remedied without sacrifice of the fundamental purpose of these laws."

Destructive Competition

Speaking of the problems of the coal industry, before the labor federation at Boston, in October, 1930, he said:

"In that industry the encroachments of electrical power, of natural gas, of improvements in consumption have operated to slow down the annual demand from its high peak, leaving a most excessive production capacity.

"At the same time the introduction of labor-saving devices has decreased the demand from mine labor. In addition to its other difficulties must be counted the effect of the multitude of 6,000 independent mine owners among 7,000 mines, which has resulted in destructive competition and final break down of wages.

"All these conditions have culminated in the demoralization of the industry and a depth of human misery in some sections which is wholly out of place in our American system. The situation has been under investigation of our government departments, by Congress, together with commissions and committees of one sort or another, for the past 10 years. The facts are known.

"One key to solution seems to me to lie in reduction of this destructive competition. It certainly is not the purpose of our competitive system that it should produce a competition which destroys stability in an industry and reduces to poverty all those within it. Its purpose is rather to maintain that degree of competition which induces progress and protects the consumer. If our regulatory laws be at fault they should be revised."

Former President Coolidge, who appointed the Federal Oil Conservation Board, and who had many problems of the natural resources industries before him, wrote, in April, 1930:

"Improved machinery, new methods of operation and large investments of capital have brought on the market so much oil, copper and lumber that a fall in prices has made much of their production unprofitable. Yet it is generally agreed that these supplies are limited and it is only a question of time when a real shortage will come.

"No doubt the public is securing commodities at prices below cost. But things are so ordered in this world that it is not to the final advantage of the public to buy large supplies below cost. The reaction is sure to be bad. Some action

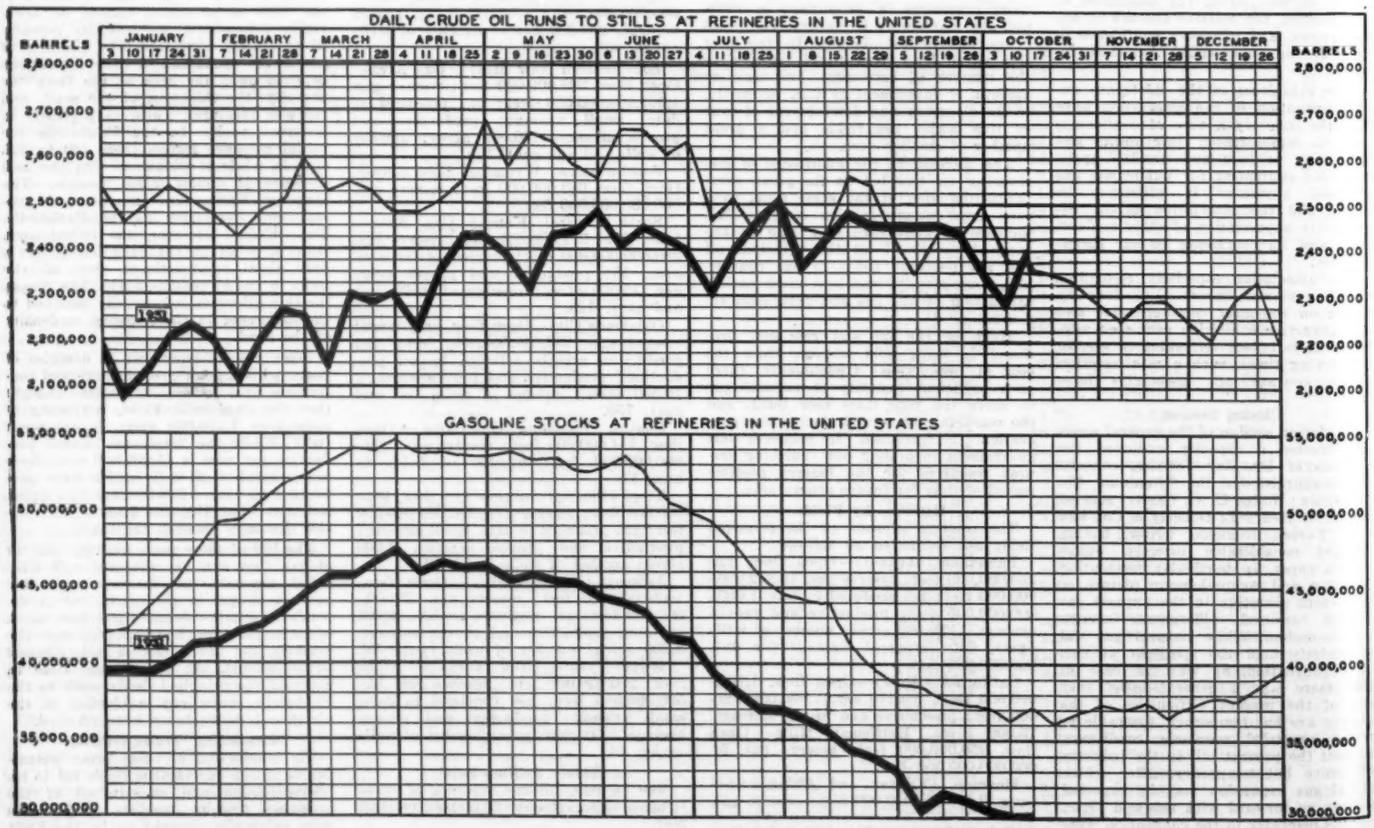
(Continued on Page 82)

AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to still, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending October 17.

	Week ending October 17				Week ending October 10				Week ending October 18, 1930			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	100.0	460,900	4,045,000	10,802,000	100.0	476,700	3,949,000	10,540,000	100.0	497,600	5,519,000	11,974,000
Appalachian	91.8	110,300	1,296,000	1,657,000	91 8	100,200	1,267,000	1,526,000	93 2	75,000	879,000	983,000
Indiana, Illinois, Kentucky	98.9	352,100	3,501,000	5,285,000	98.9	319,600	3,616,000	5,124,000	97.5	254,100	5,140,000	4,207,000
Oklahoma, Kansas, Missouri	89.6	256,700	2,755,000	5,041,000	89.6	248,100	2,803,000	5,107,000	89 4	249,000	2,438,000	4,858,000
Texas	91.3	551,300	5,451,000	11,570,000	91 3	535,400	5,199,000	11,419,000	91.9	566,000	5,739,000	10,563,000
Louisiana and Arkansas	98.9	172,400	696,000	3,620,000	98 9	166,100	780,000	3,499,000	98 3	159,400	1,142,000	2,064,000
Rocky Mountain	89.3	48,000	1,288,000	831,000	89 3	54,000	1,275,000	821,000	93.1	50,900	1,693,000	1,128,000
California	97.1	490,400	11,804,000	97,125,000	97.1	500,000	11,364,000	97,174,000	98.3	503,400	13,721,000	104,258,000
Total United States	95.2	2,442,100	30,836,000	135,931,000	95 2	2,400,100	30,253,000	135,210,000	95 6	2,360,400	36,276,000*	140,035,000
Texas Gulf Coast	99.8	414,000	4,106,000	8,226,000	99 8	411,000	3,884,000	8,095,000	100.0	422,300	4,597,000	7,677,000
Louisiana Gulf Coast	100.0	121,000	544,000	2,693,000	100 0	114,900	535,000	2,556,000	100.0	97,900	916,000	2,064,000

(1) Per cent refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.



Data for 1931 based on weekly reports of the American Petroleum Institute. Figures for last week not shown in graph but are included in above tables.

Six Strong—Dependable

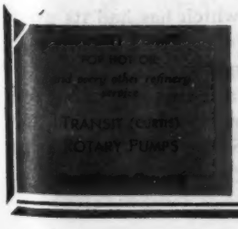
PIPE LINE Pumps IN A ROW

SIX strong, dependable pipe line pumps in a row, running smoothly and quietly.

Where there is considerable variation in the amount of oil to be pumped, a flexible installation of many units, like the above, is the last word in station efficiency.

If you have to do with the operation of a pipe line, may we suggest that you investigate these TRANSIT Texas Type pipe line pumps. We will take pleasure in giving you the details.

Address the Home Office, or any District Office of the company.



BEAUMONT, TEXAS
E. L. Wilson Hardware Company

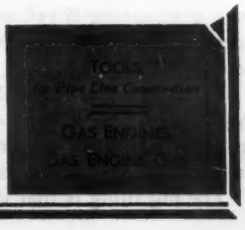
SALT LAKE CITY, UTAH
F. C. Richmond Machinery Co.

NATIONAL TRANSIT PUMP & MACHINE CO.
OIL CITY, PA.

PHOENIX, ARIZ.
Pratt-Gilbert Co.

LOS ANGELES
Republic Supply Company of California

ST. LOUIS, MO.
Reeves & Skinner Machinery Co.



NEW YORK PHILADELPHIA CLEVELAND PITTSBURGH LOS ANGELES HOUSTON TULSA NEW ORLEANS

The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

Published Weekly by
THE PETROLEUM PUBLISHING COMPANY
114-116 West Second Street
TULSA, OKLA.

Established as an International Publication in 1910 by Patrick C. Boyle.

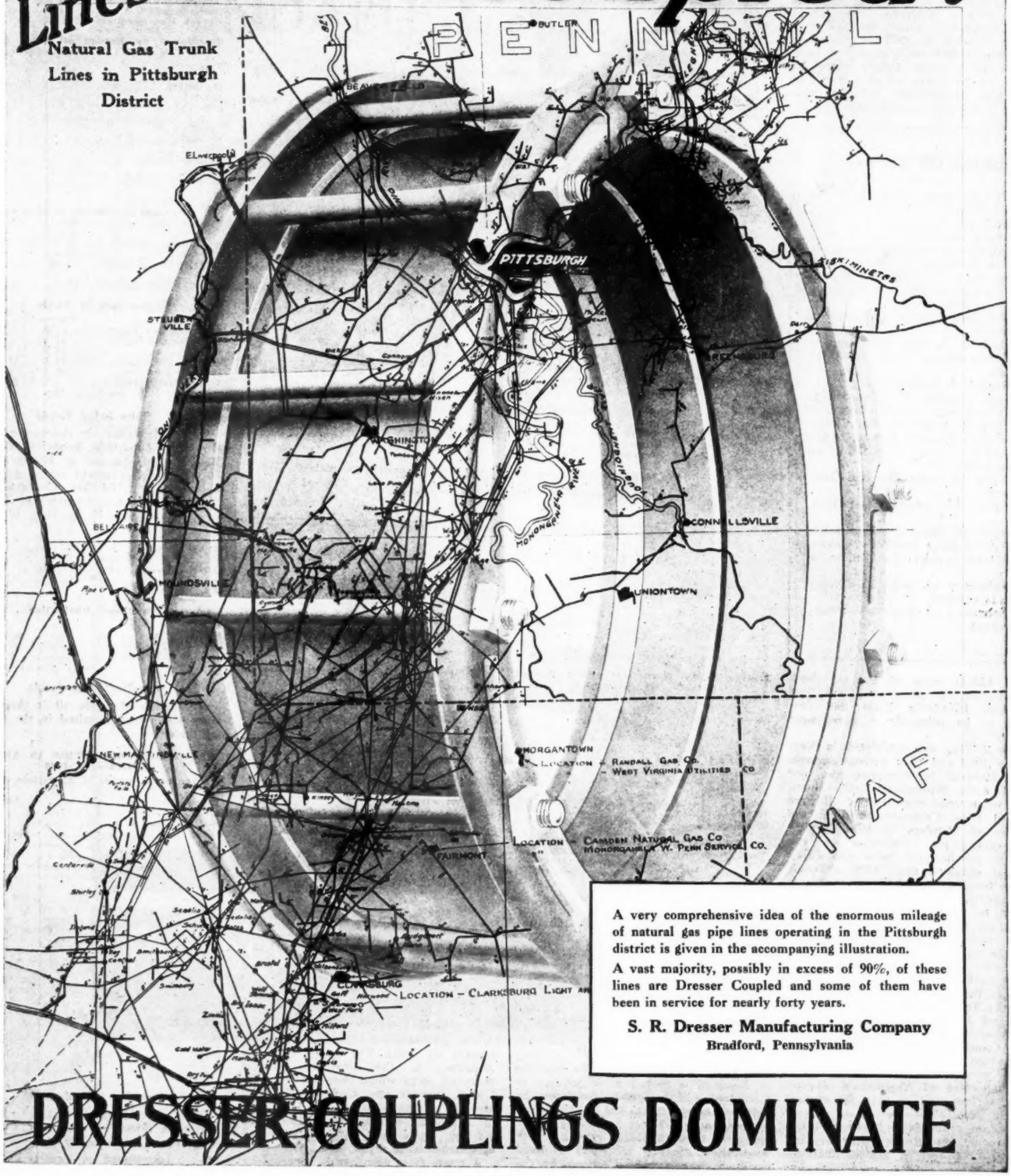
President - - - - - - - - - - - - - P. C. Lauinger
General Manager - - - - - - - - - - John M. Egan
Editor - - - - - - - - - - - - - - James McIntyre
Managing Editor - - - - - - - - - Andrew M. Rowley
Refinery Editor - - - - - - - - - - - C. O. Willson
Technical Editor - - - - - - Charles K. Francis, Ph.D.
Petroleum Engineering Editor - - - - - L. G. E. Bignell
Associate Editor - - - - - - - - - - W. T. Anderson
Associate Editor - - - - - - - - - W. T. Ziegenhain
Associate Editor - - - - - - - - - Thomas F. Smiley
Advertising Manager - - - - - - - - E. Klappenbach
Circulation Manager - - - - - - - - Simon H. Rourke

DISTRICT ADVERTISING OFFICES

C. L. CAIN - - - - - 101 Park Ave., NEW YORK CITY
C. R. FARMER - - - - - - - - - - - - - -

Oc

A Vast Majority of these Lines are DRESSER Coupled!



A very comprehensive idea of the enormous mileage of natural gas pipe lines operating in the Pittsburgh district is given in the accompanying illustration.

A vast majority, possibly in excess of 90%, of these lines are Dresser Coupled and some of them have been in service for nearly forty years.

S. R. Dresser Manufacturing Company
Bradford, Pennsylvania

DRESSER COUPLINGS DOMINATE

All Argentine Crudes Favor Cracking

Analyses of Country's Production Show Relatively Low Light Oil Yields. Refining Industry Growing in Importance

By E. F. Nelson and Gustav Egloff
Universal Oil Products Co.

The first scientific attention given to oil in the Argentine was in 1885 when explorations were made at Cacheuta in the province of Mendoza. From 1890 to 1900 discoveries of oil and bitumen were made south of Mendoza as far as the province of Neuquen. Discovery of oil in commercial quantities, however, was made only in 1907 at Comodoro Rivadavia. Government employes looking for fresh water supply struck a strong flow of heavy oil at a depth of 1,739 feet. Immediately following this discovery the Argentine government reserved 12,000 acres of the surrounding territory for government use, and Comodoro Rivadavia Field has continued to be primarily a government district.

SERIES ON REFINING

The accompanying article is the fourteenth of a series published in The Oil and Gas Journal describing the results obtainable in refining representative domestic and foreign crude oils. Additional analyses of foreign crude oils will appear in later issues.

Previous articles appeared as follows:

October 1, page 22—Peru.
September 3, page 30—Germany.
August 6, page 20—Egypt.
July 23, page 22—Venezuela.
July 2, page 16—Michigan.
June 18, page 22—Van, Tex.
May 21, page 40, Joiner, Tex.
April 23, page 30—"Unrefinable crude oils."
April 16, page 30—Mid-Continent.
April 16, page 30—Pettus, Tex.
April 16, page 30—Kentucky.
April 2, page 30—West Texas.
March 5, page 88—Oklahoma City.
February 19, page 30—South Texas crudes.
February 12, page 38—Pennsylvania.

Some drilling was attempted in Neuquen in 1908 and 1909 without success. Plaza Huincul in Neuquen was not opened until September, 1918. Meanwhile, commercial quantities of oil were obtained from Cacheuta Field in the province of Mendoza in 1914-15. The first commercial production in the northern provinces of Salta and Jujuy was not obtained until 1926 although oil was found there much earlier. Seams of Rafaelite, a paraffin-base asphaltite, similar to Grahamite in the United States, are found at Auca Mahuida.

The strata producing oil in the four chief districts are different in each case. Comodoro Rivadavia produces from cretaceous formations; Neuquen obtains oil from the Upper Jurassic; Mendoza from the Triassic; and the districts of Salta and Jujuy produce from the Upper Mesozoic to the Devonian strata.

Comodoro Rivadavia Field

Comodoro Rivadavia Field is almost entirely government exploited. It is the most important of Argentina's oil-producing regions and is over 60 square miles in area.

Comodoro crude is a heavy fuel oil type product, found at depths around 1,700 to 1,800 feet. A typical analysis of the crude is reported as follows by the U. S. Bureau of Mines, in Technical Paper 346:

A.P.I. gravity	20.8
Pourpoint °F.	15
Water, per cent	.02
Vis. S. U., at 70° F.	above 6,000
Vis. S. U., at 100° F.	2,490
Sulphur, per cent	0.17
Carbon Res. residuum, pct.	10.5

Distillation by Bureau of Mines Hempel Method (Air Distillation)

Temp. °F.	°A.P.I.
Up to 122	
122-167	
167-212	
212-257	61.8
257-302	
302-347	
347-392	52.7
392-437	45.8
437-482	39.2
482-527	34.8

(Vacuum Distillation at 40 m.m.)

Temp. °F.	°A.P.I. Gravity	Cloud Test °F.
Up to 392	29.7	Below 5
392-437	27 1	12
437-482	25 6	36
482-527	23.8	48
527-572	22.3	52

Summary of Yields

	Per cent	°A.P.I.
Lt. gaso. and naph.	4 9	55 7
Kerosene dist.	1 7	45.8
Gas oil	10.9	34.6
Nonviscous lub. dist.	6 6	29 9–25 4
Medium lub. dist.	4 7	25 4–23 7
Viscous lub. dist.	7.9	23.7–21.5
Residuum	63.2	15 4
Distillation loss	0.1	

Plaza Huincul Field

Plaza Huincul Field in the province of Neuquen is second in importance to Comodoro and is largely developed by private organizations. Oil in this field is found at 2,314 feet and is lighter in character than Comodoro crude. A representative analysis of Plaza Huincul crude oil is reported as follows by the U. S. Bureau of Mines, Technical Paper 346:

A.P.I. gravity	33 8
Pourpoint, °F.	Below 5
Water, per cent	Nil
Vis. S. U., at 70° F.	75
Vis. S. U., at 100° F.	55
Sulphur, per cent	0.29
Carbon Res. residuum, pct.	9.9

Distillation by Bureau of Mines Hempel Method (Air Distillation)

Temp. °F.	°A.P.I. Cut
Up to 122	
122-167	
167-212	70.6
212-257	59.7
257-302	55.4
302-347	51 6
347-393	48.1
392-437	45 4
437-482	42.3
482-527	39.6

(Vacuum Distillation at 40 m.m.)

Temp. °F.	°A.P.I. cut	Cloud test °F.
Up to 392	37.8	28
392-437	33 8	52
437-482	30 2	52
482-527	28.2	68
527-572	26.4	82

Summary of Yields

	Per cent	°A.P.I.
Light gasoline (to 212°F.)	5 2	70 6
Gaso. and naph.	25 1	56.7
Kerosene dist.	10.1	42 6
Gas oil	16 6	37.4
Nonviscous lub. dist.	10 3	33.2–28 0
Medium lub. dist.	6.3	28.0–25.6

Crude from Mendoza Area

The province of Mendoza contains several oil fields. The valley of Cerro Alquitran in this province contains many oil seeps which show oil from the Upper Jurassic age. Cacheuta Field in Mendoza is the oldest explored oil area in Argentina although its development did not begin until 1914-15 when oil was struck at a depth of 3,240 feet.

A crude from Mendoza is reported by the Bureau of Mines, Technical Paper 346, as follows:

A.P.I. gravity	30.8
Pourpoint, °F.	55
Water, pct.	Nil
Vis. S. U., at 70° F.	133
Vis. S. U., at 100° F.	71
Sulphur, pct.	0.19
Carbon Res. residuum, pct.	8.6

Distillation by Bureau of Mines Hempel Method (Air Distillation)

Temp. °F.	°A.P.I. Cut
Up to 122	
122-167	
167-212	
212-257	59.2
257-302	55.7
302-347	52.5
347-592	48.8
392-437	46 0
437-482	43.0
482-527	39.2

(Vacuum Distillation at 40 m.m.)

Temp. °F.	°A.P.I. Cut	Cloud test °F.
Up to 392	35 6	14
392-437	32.8	34
437-482	31.3	52
482-527	28 4	72
527-572	26.3	88

Summary of Yields

	Per cent	°A.P.I.
Ttl. gaso. and naph.	17.5	53.2
Kerosene dist.	11 9	44.5
Gas oil	15 8	36.8
Nonvis. lub. dist.	11 5	32.6–28.9
Medium lub. dist.	7.1	28 9–26.6
Viscous lub. dist.	4.5	26.6–25.2
Residuum	32.2	16.0

Salta-Jujuy Crude

Salta and Jujuy are the northernmost states in Argentina, bordering Bolivia. The Morro Quemado or Hunter Dome in this region contains oil in dolomitic limestone at 1,750 feet. Characteristics of this crude are reported as follows by Hunter (J. I. P. T., Oct., 1924):

Color	Black
A.P.I. gravity	15.9
Vis. at 50° C. (Engler)	350.6
Calorific value (cals)	10,719
Sulphur, pct.	.527
Water, pct.	4.90

Fractional Distillation

	Pct.
Up to 347° F.	3.40
347-572° F.	12 00
572-680° F.	17 00
Residuum	62.70

Production of Crude

Production of crude oil in Argentina since 1907 is summarized in the following table.

CRUDE OIL PRODUCTION IN ARGENTINA—1907-1930

(Figures in barrels of 42 gallons each)

Year—	Total Argentina
1907	181
1908	11,454
1909	18,892
1910	30,714
1911	13,099
1912	46,933
1913	130,409
1914	275,468
1915	513,139
1916	865,199
1917	1,210,014
1918	1,351,514
1919	1,339,077
1920	1,651,091
1921	2,056,235
1922	2,865,079
1923	3,335,015
1924	4,658,983
1925	5,988,493
1926	7,839,513
1927	8,629,646
1928	9,070,596
1929	9,391,385
1930*	9,400,000

*Estimated.

Cracking Comodoro Oil

Blended residuum from the Comodoro Rivadavia Field in the Argentine was subjected to cracking by the simultane-

(Continued on Page 98)

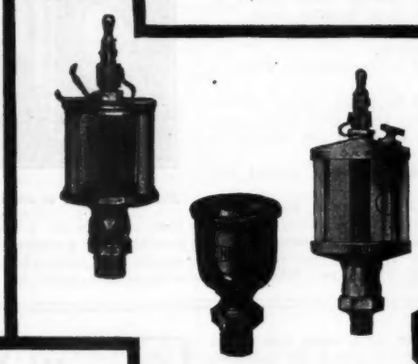
PETROLEUM REFINERIES IN ARGENTINA

Company—	Location	Daily capacity (bbls.)	Source of crude	Products	Age of equipment
Cia. Nacional de Petroleos (Ltda.) Diagonal Roque Saenz Pena 567, Buenos Aires	Campana	10,500	United States, Peru Mexico and Colombia	Complete range	Modern
Cia. Nacional de Petroleos (Ltda.) Diagonal Roque Saenz Pena 567, Buenos Aires	Bahia Blanca	2,100	Argentina	Oil fuels only	Modern
Standard Oil Co., S. A., Av. Roque Saens Pena 567, Buenos Aires	Embarcacion	490	Argentina	Oil fuels only	Old
Yacimientos Petroliferos Fiscales (Argentina Government), Calle Paseo Colon 922, Buenos Aires	La Plata	14,000	Argentina	Complete range	Modern
Yacimientos Petroliferos Fiscales (Argentina Government), Calle Paseo Colon 922, Buenos Aires	Comodoro Rivadavia	1,120	Argentina	Complete range	Old
Yacimientos Petroliferos Fiscales (Argentina Government), Calle Paseo Colon 922, Buenos Aires	Plaza Huincul	700	Argentina	Oil fuels only	Old
Cia. Itaca (3 refineries) Calle 25 de Mayo 145, Buenos Aires	Campana	2,100	Peru and Argentina	Complete range	Partly modern
La Isaura, Loma Paraguaya, Bahia Blanca	Bahia Blanca	....	Argentina	Oil fuels only	Old
Cia. Ferrocarrilera de Pet. (British Railways) Cangallo 564, Bueno Aires	Comodoro Rivadavia	8,190	Argentina	Oil fuels only	Modern
Cia. Astra, Calle 25 de	Comodoro Rivadavia	4,380	Argentina	Oil fuels only	Old
El Condor (Coppock y Morales), Lavalle 39, Avellaneda	Avellaneda	350	Peru and Argentina	Oil fuels only	Old
El Condor (Cia. Gral de Comb), Avellaneda	Avellaneda	350	Peru and Argentina	Oil fuels only	Old
La Petrolera Argentina (Marianoff), Calle Velez Sarsfield, Buenos Aires	Avellaneda	175	Peru and Argentina	Oil fuels only	Old
Lottero y Gorleri, Chacabuco 732, Buenos Aires	Avellaneda	210	Peru and Argentina	Oil fuels only	Old
Diadema (Royal Dutch)	Buenos Aires	1,500			Building
General Fuel	Buenos Aires	....			

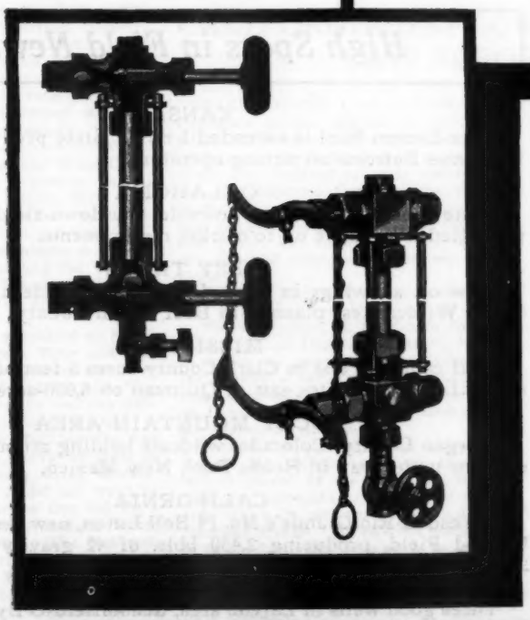
ALWAYS DEPENDABLE

PENBERTHY injectors, liquid level gages, and lubricating devices are universally used in field, refinery and natural gasoline plant because they have always been dependable under the most severe service conditions.

Penberthy Products are carried in stock by supply houses everywhere.



PENBERTHY PRODUCTS



PENBERTHY INJECTOR COMPANY

DETROIT

ESTABLISHED IN 1886

CANADIAN PLANT, WINDSOR, ONT.

Improved Distant Recording System

New Method of Registering Pressures in Pipe Lines, Tanks, Reservoirs and Other Containers Located at Some Distance From Central Office

By L. G. E. Bignell
Petroleum Engineering Editor

As pipe line systems are expanded and are operated by various automatic controlling devices there has been a growing desire upon the part of engineers to have some means of securing pressure readings from distant points and having these pressures transmitted to a centrally located office where they may know instantly the conditions at any point along the line. This requirement exists for oil, gas and water systems and can be expanded to include remote indication to measure or indicate a quantity or magnitude of energy, liquid level in tanks, pressure in various types of equipment and numerous other uses.

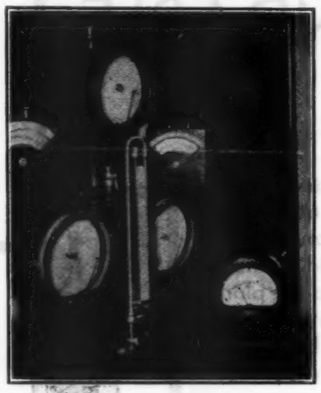
Having recognized this need the engineers for the Pittsburgh Equitable Meter Co., Pittsburgh and Tulsa, have worked out what is known as "The Telemco System" for remote indicating and recording which is very simple and meets all of the following requirements such as might be set up by a gas pipe line system, but which will also apply to other systems just as well.

1. It should be capable of operating on two wires only, or one wire and ground return.
2. The current on the wires should be so small and of such a low voltage that it will not be objectionable to telephone or telegraph companies who have wires that can be leased.
3. It should be capable of being checked for accuracy at the receiving end.
4. It should require power at the receiving end only, since electrical current is not always available where the transmitter is to be placed.
5. It should not be affected by stray currents induced on the line.
6. There should be absolutely no possibility of any sparks which might ignite gas or oil from possible leaks.
7. It should be capable of accuracy over long distances.
8. It should be accurate to within 1 or 2 per cent.
9. It should be progressively indicating or recording from zero to a maximum (that is, it should not operate in steps).
10. It should be simple, rugged and reliable.
11. Its accuracy should not be affected by variations in current voltage.

Description of Instruments

The Telemco System consists of a transmitter and a receiver. The transmitter may be placed where the measurement is to be taken and the receiver where this measure is to be indicated or recorded.

The transmitter is a very simple device



Receiver located at central pressure station.

that consists of a variable inductance consisting of a closed copper loop wound on an iron core which is revolved in a wire wound stator. By shifting this rotor through approximately 90 degrees the inductance of the device is varied in the ratio of about 8 to 1. The power required to move the rotor is very little and is principally consumed in overcoming friction in the bearings. The pressure will actuate a bourdon tube or the pen operating mechanism of a recording gauge and by the use of connections between these devices and the end of the rotor it can be rotated as the pressure within the system is varied.

The receiver consists essentially of a special purpose vacuum tube that has been developed by the Westinghouse research laboratories, particularly for industrial uses; a milliammeter and a voltage regulator.

The plate of the vacuum tube is connected to the source of alternating current through a milliammeter. By changing the value of the variable inductance at the transmitter the phase relationship between the voltage impressed on the grid and the voltage impressed on the plate may be changed.

Nearly everyone is familiar with the principles of vacuum tubes such as used in radio sets, and therefore know that when the voltages are in phase, that is, when the positive half cycle on the grid is in phase with the positive half cycle on the plate, the maximum current will flow from the plate to filament and will

(Continued on Page 82)

Late Fields

CALIFORNIA

LOS ANGELES, Calif., Oct. 20.—The Barnsdall and Rio Grande's No. 14 Bell Luton which discovered a new deep zone in the Elwood Field, a few days ago is at present producing 2,430 bbls. of exceptionally clean 42 gravity oil. Current gas production approximating 2,200,000 feet per day contains a little better than 2½ gallons of casinghead gasoline per 1,000 feet of natural gas. This well which is severely beaned back has a potentiality of approximately 5,000 bbls. per day.

SOUTHWEST TEXAS

SAN ANTONIO, Tex., Oct. 20.—Neal, Milton & Kepley's No. 1 Roark, in the Saxet Field in Nueces County at 4,832 feet, tested salt water. It may be due to a poor job of setting casing. On drill stem test the well flowed in about 15 minutes, pipe line oil. Casing was set and the well was allowed to come in late last week with salt water the result. The operators have pulled the tubing and are working with the well to find the trouble. When it was swabbed it made some oil at first but finally flowed nothing but salt water. Casing was set at 4,822 feet and it is believed that there was no mistake in getting it at the right depth and 400 sacks of cement were used in setting it. One of the theories is that there is a cracked casing in the string. For a test that made such a good showing on drill stem test it is one of the biggest disappointments in the year.

Saxet Oil Co. is arranging to start a test, a north offset to the F. P. Zoch No. 1 Baldwin, which is a gasser at 2,400 feet. The new test of the Saxet on the Donigan lease will go to the 4,800-foot sand and is directly in line on the anticline with the No. 1 Roark.

John F. Camp's No. 1 Dan Denman, in Guadalupe County, southwest of the Darst Creek Field, which hit the chalk low, went into a crevice at around 2,400 feet and on drill stem test filled the drill stem to the top in 10 minutes. It has set casing and will be ready to complete this week.

GULF COAST

HOUSTON, Tex., Oct. 20.—Cullen & West and Gulf Production Co.'s No. 2 George, deep test on the south side of the Lockwood Field, Fort Bend County, Texas, which tried to blow out while being completed in sand at 5,123-74 feet Sunday, Tuesday was under control and blowing dry gas, 1,000 pounds pressure, through an inch choke. This is a new sand in this pool, the three previous completions having made oil producers in sand at 3,500 feet.

OKLAHOMA

The State's deepest test was being cased with 6⅝-inch at 9,777 feet where the circulation was lost and the pipe has not been cemented. The test is Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 6 Preston-Culp, NW cor. NE, Section 6-5-9w, in the Cement Pool, in Caddo County. The total depth of the test is 10,079½ feet, the deepest test in the United States being drilled with a rotary unit. The companies plan to continue drilling the test deeper with 3-inch special tools until the Wilcox sand has been reached or they run out of hole. Several showings of oil and gas have been found in the test in shallow sands some

(Continued on Page 104)

MAGNETIC STORM

Tucson, Ariz., observatory of U. S. Coast and Geodetic Survey advises that a moderate magnetic storm began at 8 a.m. (C.S.T.) on October 12 and ended at 3 a.m. (C.S.T.) October 13. First report of this storm was carried in The Oil and Gas Journal of October 15 but the storm had not ended before press time. The telegrams follow:

"Storm began twelfth. Fourteen. Moderate."

"Storm ended thirteenth. Nine."

High Spots in Field News

KANSAS

Ritz-Canton Pool is extended 1 mile. State production declines. Cheyenne Bottoms attracting operators.

OKLAHOMA

State production below allowable, shutdown fields reopened not permitted to produce up to market requirements.

WEST TEXAS

New oil showings in Irion County and western Crane County tests. Wildcat test planned in Deaf Smith County.

MISSISSIPPI

Gulf company test in Clark County cores 8 feet of likely looking sand. Is about 5 miles east of Quitman on 8,000-acre block.

ROCKY MOUNTAIN AREA

Morgan County, Colorado, wildcats holding attention. Five operations under way in Hobbs Pool, New Mexico.

CALIFORNIA

Barnsdall-Rio Grande's No. 14 Bell Luton, new deep zone well in Elwood Field, producing 2,430 bbls. of 42 gravity oil; potential 5,000 bbls.

SOUTHWEST TEXAS

Three good wells in Laredo area, Schoolfield-O'Byrne Pool, Cole gas field and Escobas-Muckelroy Fields. Ten new locations in Southwest Texas.

NORTH LOUISIANA-ARKANSAS

Best well in Urbana Field, Union County, Arkansas, in some time gauges 615 bbls. Drilling activity increases in wildcat areas and Sabine Parish.

EAST TEXAS

New record for first reports, 190 new locations, with 127 wells completed. Expected there will be 3,500 wells before end of year. New allowable plan in Van Field.

GULF COAST

Deep test in Lockwood district, Fort Bend County, in new sand at 5,123-74 feet, which tried to blow out, is now under control and blowing dry gas. McFaddin gas field extended.

New Location Record in East Texas

First Reports During Week Numbered 190 With 127 Wells Completed. Will Be 3,500 Wells Before End of Year. Upshur Getting Play

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

DALLAS, Tex., Oct. 19.—The East Texas district broke all location records again during the week when 190 first reports were turned in by all the companies and operators. The previous high mark was 176 locations in one week. There were 127 wells completed in the district. It seems as if there would be no let-up to drilling activities, regardless of the continuous curtailment on the per well basis, and it is difficult to conjecture as to just how many wells will be drilled in the district before activities slow up. There will no doubt be at least 3,500 wells completed by the first of the year, or more than half of the number which will eventually be drilled on the 120,000 estimated potential producing acres in the district. All contractors are busy in the area, and one company was having difficulty in obtaining contractors for drilling up several locations which it had staked in the southern part of the district, Rusk and Smith County, giving an idea of the rapid pace which companies and independents are sinking the wells.

Upshur County

Acreage is being blocked in southeastern Upshur County, north of the Eslick producer, which is the farthest northern producing well in Gregg County. Dry holes have defined limits of the pool farther to the west, but it is believed that production will be extended to the north in Upshur in a narrow strip, up around the town of Jamestown.

Hunt, Rains and Hopkins Counties, to the north of Van Zandt and Wood Counties, are also getting a leasing play at this time, one block having been mentioned in this column in last week's issue of The Oil and Gas Journal. Kelsey & Bolton are assembling a 20,000-acre block centering around the William Mason and James Rhoads Survey in Hunt County and will drill a test on this block.

Bedereck & Taylor assembled an 8,000-acre block in the Jones, Bone and Hilburn Surveys in Ellis County, and have turned 4,000 acres of it for a test. The test is now drilling on the Golliday 240-acre farm in the John Bone Survey.

The Humble Oil & Refining Co. has released 760 acres on the Crews farm in the L. Perkins, western Gregg County, due to the fact that it did not want to drill a west offset to the Sun Oil Co.'s No. 1 Walker which is making better than 42 per cent water. The Sun well is in the William Friar Survey.

Now 2,450 Producers

There were 2,450 completed producing wells in the East Texas district on the morning of October 17, total production for the 24 hours ending at 7 a. m. on that day registering a total of 389,788 bbls. with 20 wells off production for one reason or another. Wells are being completed at the rate of from 15 to 18 daily, causing the daily production to gradually climb back to the 400,000 bbls. maximum allowed for the field by the Railroad Commission.

Trinity Test in Van

The Pure Oil Co. is now moving in heavy equipment to drill a Trinity sand test in the northern part of the Van Field, Van Zandt County, this test to be named its No. 1-T V. T. Davis, the "T" denoting that it is to be a Trinity sand test. Location is 400 feet north of the north line of the company's Tunnell No. 8 lease, and 480 feet west of the east line of the survey, or 1,292 feet west of the most easterly east line of the Nacogdoches County School Lands Survey. Elevation of the test is 488.4 feet. Laughlin Brothers will drill the test. This test is in territory which is considered as dry from the standpoint of obtaining production from the Woodbine sand, and as the company has several hundred acres of leases which will expire soon if production is not obtained, this test is being drilled in an effort to obtain production from the Trinity, and prove whether that formation will produce in this area. In case the test proves a producer it will not cause an active drilling campaign at this time, due to the expense of putting down such a deep test, and also due to the fact that the Humble Oil & Refining Co., Sun Oil Co. and Pure Oil Co. own practically all of the surrounding acreage. The test is also well within the unitized block which is held by these three companies, and The Texas Company and Shell Petroleum Corp. If the sand proves unproductive it will remove another potential producing formation and territory from the list of untested territory. A world of geological information will also be gained by drilling this test, regardless of whether it proves a producer.

New Proration Plan in Van

A new proration method was adopted for the Van Field, Van Zandt County, this week, a plan advocated by petroleum engineers who have been studying the field, production and methods of proration, but which has never before been tried in any field in the State. The allowable of 50,000 bbls. per day remained unchanged, however.

The past method has been on the potential-acreage plan, the new plan will distribute production proportionately among all leases on a per acre-feet basis. Depth of the sand is the prevailing factor in this new method, although the surface acreage is also a deciding factor. To arrive at the proportionate share of the 50,000-bbl. outlet, the surface acreage is multiplied by the average depth of the sand, which will give the number of acreage feet of ownership of the various companies which have production in the pool. The average depth of the pay sand in the field was reported as 286 feet. The estimated daily potential is 2,500,000 bbls.

Pumping and Dead Wells

The following report graphically depicts the number of pumping and dead wells in the district, and those which flow only upon agitation. There are 109 such wells, out of a total of over 2,400 producing wells. Fifty-eight of the pumping wells are in the Joiner area, Rusk County, practically all of them being on the extreme eastern side of the field. Two are in the Kilgore area. Of the 24 dead wells, 21 are in the Joiner area, and 3 are in the Kilgore area. They are also on the eastern side of the producing area. The 84 pumping and dead wells produced a total of over 2,212,200 bbls. before they stopped flowing, or an average of 26,334 bbls. per well. The wells which require agitation to make them flow are all in the Joiner area. Thick strata of saturated sand and low pressures are responsible for this area showing such a number of wells which have fallen off of flush production.

Paraffining Trouble

There is one well standing dead in the Lathrop area at the present time, Tidal Oil Co.'s No. 1 Nettleton, in the John Ruddle Survey, but this is due to the paraffining of the tubing; the well refuses to flow through the tubing. Paraffining is rapidly becoming a nuisance in the district, and as colder weather approaches it will become more of a problem for the operators. Some companies have been experimenting with different kinds of chemicals for preventing paraffining tubing, and cutting it from the tubing, or dissolving it, and more experiments will be tried as paraffin continues to cause trouble for the production departments.

WELLS WHICH HAVE GONE DEAD IN EAST TEXAS FIELD

Joiner Area (Rusk County)

Anderson and others' No. 1 Bradford.
Babcock Brothers' No. 2 Camp.
Big Indian Oil Co.'s No. 1 Deason.
East Texas Refining Co.'s No. 1 Ashby.
East Texas Refining Co.'s No. 4 Ashby.
East Texas Refining Co.'s No. 1 Mayfield-Alford.
Elzy Drilling Co.'s No. 1 Camp.
George Pace's No. 1 Camp.
Federated Oil Co.'s No. 1 Camp.
Federated Oil Co.'s No. 4 Camp.
Hammond and others' No. 1 Camp.
Hoosier and others' No. 1-B Tolliver.
H. L. Hunt's No. 1 Mayfield-Alford.
Indian States Oil Co.'s No. 1 Tolliver.
Mabee's No. 1 Maxwell.
A. W. Phillips' No. 1 Deason.
Robertson Drilling Co.'s No. 1 Deason.
Sinclair Oil & Gas Co.'s No. 7 Holland.
Stroube & Stroube's No. 1 Frederick.
Tex-Loyd's No. 1 Camp.
Vitek Oil Co.'s No. 1 Jobe.

Puzzling Wells

One well on the southeastern side of the field, Stanolind Oil & Gas Co.'s No. 2-A Schuler & Schuler in the Cadene Survey, looks as if it was marked for a dry hole as it is now standing shut down at 3,688 feet, drilling the last 50 feet in shale, making only two heads of oil after it was washed one day with oil, one day with water, and then the air put to it. After making these heads it failed to continue flowing. The sand was cored from 3,636-37 feet, which makes top of sand minus 3,228 feet with surface elevation 408 feet. Subsea datum on bottom of hole is 3,280 feet. But another well, located on the western side of the Kilgore Pool, Tidal Oil Co.'s No. 1 Dansby, in the W. P. Chisum Survey, Gregg County, had the same appearance as this well, appeared as a failure for some time, and then created a big surprise by coming in for an estimated 12,000-bbl. well, consequently the Stanolind test may also make a change for the better.

The Tidal producer was drilled to 3,747 feet in sand, 9 feet in the pay, after topping it at 3,738 feet, and was swabbed for several days before it responded to the agitation, and came through for a producer. Elevation of the test is 323 feet, the Pecan Gap chalk was cored from 2,650-3,110 feet

(Continued on Page 86)

CALIFORNIA GAS CONSERVATION LAW BEFORE SUPREME COURT

WASHINGTON, D. C., Oct. 19.—The California statute, enacted in 1929, prohibiting the unreasonable wastage of natural gas in the production of oil in that State, was declared by state counsel before the Supreme Court of the United States to constitute not only a conservation measure, in the interests of the general public, but as well a protection of the rights of adjoining landowners in oil fields.

The court had under consideration the case of Bandini Petroleum Co. and others v. Superior Court of California for the County of Los Angeles and others, No. 43 in which oil companies are challenging the validity of the law. Arguments in the case, begun on October 13, were concluded on October 14 and the case taken under advisement by the court.

Counsel for the petroleum companies, Robert B. Murphey, argued that the statute passed by the California legislature was uncertain as far as the standards which it set were concerned, and therefore invalid. He referred particularly to the fact that the statute merely refers to the "unreasonable waste of natural gas." He contended that the word "unreasonable" does not establish a definite standard.

In reply to a question of Justice McReynolds as to whether the word "waste" by itself would establish a sufficiently definite standard, Mr. Murphey replied that he did not think it would. He called the court's attention to the fact that a great many people had different conceptions as to what really constituted "waste" in the production of gas and oil.

James S. Bennett, attorney for the Director of Natural Resources for the State of California, explained that the California courts have decided that the owner of land has the right to produce his reasonable proportion of the underground supply of gas and oil. He stated that they had rejected the theory that the owner was entitled only to the particular supply which might be located directly under his land.

The State's counsel claimed that in the light of this interpretation of the law, the use of the word "reasonable" becomes clear and does set forth a definite standard because "reasonable" then means that the owner of land is entitled to his proportionate share of gas and oil.

Mr. Bennett said that in conformity with this theory of the law the California court in this case had decided that a certain amount of gas flow was to be permitted during each average day for the entire field. Then, he said, on the basis of this total amount each owner of land had been allotted his proportionate share. He pointed out that if any operator took more than his share he would be causing an "unreasonable waste."

Mr. Murphey also argued that the statute was unconstitutional because its sole purpose was to conserve gas for the future benefit of the general consuming public and was not enacted merely to protect the rights of the owners of lands in which the supply of oil and gas was found.

He stated that the primary purpose of setting up a definite consumption figure for the entire field was to save gas for the consuming public rather than to protect the rights of adjoining landowners, and that, therefore, the petroleum companies were being deprived of property for the use of the public without just compensation. In dealing with this phase of the argument Mr. Bennett showed how the act would benefit the public.

Justice Sutherland asked if the California court did not reject the idea that the law was a conservation measure. Mr. Bennett replied that he did not think the court had rejected this idea although it did place emphasis on the fact that it was a measure designed to protect adjoining landowners.

In this connection Mr. Bennett also informed the court that he felt the statute would apply even though a single landowner was involved and the rights of adjoining landowners were not in issue.

Revised Allowables for West Texas

New Oil Showings in Irion County and Western Crane County Tests. Activities Picking Up in North Texas. Deaf Smith Test

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Oct. 19.—There were four locations reported for West Texas during the week, one in Fisher County, a remote wildcat in Terrell County and two in the Lane and Shirk producing areas of the McCamey Pool, Upton County, with three producers marked off as completed wells, one in the McCamey Pool, one in the O'Brien area of northern Ward County and a deepened well in the Settles Pool of Howard County. The latter well was increased to 918 bbls. per day, pumping, when deepened to 2,401 feet. Increases of oil were picked up from 2,350 and 2,397-2,401 feet.

Stanolind Oil & Gas Co.'s No. 1 Williams in the T.T.R.R. Survey, Irion County, encountered another oil showing this week at 6,725 feet in sand. A small show was found last week at 6,652-65 feet in the test, but neither of the showings was sufficient to attract much attention. The test is now drilling at 6,740 feet, seeking the deep horizon from which production in the Big Lake Field, Reagan County, the western adjacent county, is found.

D. H. Byrd of Dallas is to take over Shipley's No. 1 Monroe test in Section 3, Block 1, W.&N.W. Survey, northwestern Ward County, which has been shut down for some time at 4,545 feet, and will carry it to around 4,750 feet to test the Delaware lime. It is approximately 14 miles southeast of the Wheat Field in Loving County, and 4 miles north of the nearest test, which was dry.

An interesting sale was made in the Wheat Field, Loving County, this week when A. R. Eppenauer and L. E. Lockhart sold their interest in the 80 acres on which the Eppenauer and others' No. 1 Johnson extension producer is located. The Eppenauer Drilling Co. was the purchaser, paying $60,000 for the well and acreage, of which $25,000 was paid in cash. The well is now averaging around 90 bbls. per day, but will be worked over and reshot. Top of the pay was logged at 4,362 feet, and the well was drilled to a total depth of 4,394 feet, but plugged back to 4,391 feet before completed.

Western Crane Showing

Penn Oil Co. and others' No. 1 Tubbs in western Crane County encountered another showing of oil this week when drilling from 2,992-95 feet. The estimated 2,500,000 feet of gas which was struck at 2,830 feet has been bradenheaded. The 8¼-inch casing was set at 3,027 feet, and the well is now drilling at 3,075 feet. The test is located in Section 3, Block B-27.

New allowables for West Texas fields are as follows: Yates Pool, Pecos County, 65,000 bbls.; Crane-Upton, 16,700 bbls., Ector County, 6,300 bbls.; Howard-Glasscock, 26,000 bbls., and Winkler County, 40,000 bbls.

Cranfill & Reynolds encountered disappointment in their No. 1 George, a south offset to The Texas Company and others' No. 1 Jean producer in the Royston Pool, Fisher County, this week, when the test encountered salt water and the hole started filling at 3,155 feet. It will be drilled to around 3,800 feet where another pay horizon is expected to produce.

The test is in Section 200, B.B.B.&C. Survey in the northeastern corner of the county. It had only a small showing of oil from 3,132-36 feet, where the regular Fisher pay should have been topped. The Texas Company producer is producing at a total depth of 3,105 feet. Lime porosity is the governing factor in the production of the wells in this area.

PANHANDLE DISTRICT

A remote wildcat location was staked in Deaf Smith County this week by the Western Union Oil Co. on the Farwell ranch, the exact location being in the center of the NW Section 18-3n-2e, on the extreme western side of the Panhandle district. McFann and Price of Oklahoma City will drill the test on which cable tools will be used. The Western Union Oil Co. has a block of 18,000 acres in this area, which is located on what is known as the Garcia Lake structure. The company has headquarters in Amarillo.

Four other locations were made in the district during the week, all of them in proven areas in Gray County, the Kewanee Oil & Gas Co. made two of them, Pulse and others made one and the Skelly Oil Co. made one. All are located in Block 3, I.&G.N. Survey.

NORTH TEXAS PRODUCTION
Week Ending October 17

Panhandle district—	Bbls.
Carson County	5,721
Gray County	44,012
Hutchinson County	13,715
Moore County	1,046
Potter County	....
Wheeler County	424
Total production this week	64,918
Total production last week	64,536
Increase	382

Wichita Falls district—	Bbls.
Archer County	12,055
Baylor County	635
Clay County	502
Cooke County	1,644
Foard County	70
Haskell County	24
Jack County	2,095
Montague County	3,296
Throckmorton County	502
Wichita County	17,174
Wilbarger County	13,053
Young County	11,686
Total production this week	62,736
Total production last week	60,778
Increase	1,958

Ranger district—	Bbls.
Brown County	3,102
Callahan County	1,518
Coleman County	2,172
Comanche County	740
Palo Pinto County	372
Eastland County	2,724
Shackelford County	3,252
Stephens County	3,800
Total production this week	17,680
Total production last week	17,656
Increase	24

NORTH CENTRAL TEXAS

Activities are gradually picking up in this district, especially since the entire territory received a couple of good rains replenishing the greatly depleted water supply which had diminished to the point of holding up further drilling in many of the areas.

There were 13 locations staked in the Ranger and Wichita Falls district during the week, divided as follows: Two in Shackelford County, one in Stephens, one in Palo Pinto, one in Throckmorton, three in Young, four in Archer, and one in Wichita County.

The Waggoner Refining Co. contemplates keeping one rig drilling in the Grayback Pool, Wilbarger County, drilling these wells down to the pay, cementing casing, then moving rig to another location, drilling in the well later when the market permits. The company has just set casing on its No. 9-J and moved the rig to No. 14-E which it is now drilling.

Twelve Completions

There were 12 completions in the district this week, including the completion of 2 deep tests.

Harris and others' No. 1 Jake Eckstein in north Grayson County, one of the deep wildcat tests being drilled in the district, resumed drilling this week after a several weeks' shutdown. It is now below 2,990 feet.

D. L. Wolfe's No. 1 Gilbert, in eastern Archer County, drilled to 2,232 feet to test the Canyon pay, but had no showings of oil and gas. This is one of the deep tests of the area, which is apparently doomed to failure.

The Consolidated Oil Co., Deep Oil Development Co. and Atlantic Oil Producing Co. are to drill a joint test at Chalk Hill in Archer County, the test to go to the Canyon group. Location has been made 1,470 feet out of the southwest corner of Block 76, A.T.N.C. Survey, on the Wilson farm.

The Mid-Tex Petroleum Corp.'s new refinery at Eliasville, Young County, is shut down. Unsettled market conditions was given as a cause.

(Continued on Page 86)

WILDCAT OPERATIONS IN WEST TEXAS

Week Ending October 19

BREWSTER COUNTY

Company, well, farm name, section and block—	Remarks:
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. Sur.	Shut down 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	Shut down 1,302 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 930 ft. from N and 2,500 ft. from E of Sec. 18, Blk. G-15, G.C.& S.F. Sur.	Shut down 2,900 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 miles south Alpine	Shut down 1,750 ft.

COCHRAN COUNTY

Penn Oil Co.'s No. 1 Myrick, C Labour No. 80 of League 129, Carson County School Lands	Drlg. 2,010 ft.

CONCHO COUNTY

Beesley et al's No. 1 Waring Estate, 400 ft. from N and E Sec. 163, T.&N.O. Sur.	Shut down.
Betts & Dennis' No. 1 H. E. Woods, 710 ft. from E and 150 ft. from S Sec. 2, H.E.&W.T. Sur.	Shut down 80 ft.
Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 130, 6 miles W of Paint Rock	Shut down 1,850 ft.

CRANE COUNTY

Southwest Oil Prod. Co. (Cranfill Bros.) & Penn Oil Co.'s No. 1 J. B. Tubb, 330 ft. from N and E of SW cor. of S 80 acres of NW cor. Sec. 3, Blk. B-27, P.S.L. Sur.	Set 8¼-in. casing 3,027 ft.

CROCKETT COUNTY

Doleman & Moore's No. 1 Ferner 2,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur.	Spudded and shut down.

CULBERSON COUNTY.

Kornrumpf et al's No. 1 Garren, 320 ft. S and W, Sec. 15, Blk. 79, Public School Land	Shut down 1,300 ft.

DAWSON COUNTY

Albaugh et al's No. 1 Robinson, C NW Sec. 46, Blk. M, E.L.&R.R. Sur.	To resume drilling.

ECTOR COUNTY

Weekly Oil Corp. et al's No. 1 Cowden, 1,980 ft. from N and W Sec. 33, Blk. 43, Twp. 2s, T.&P. Sur.	Total depth 890 ft.; underreaming 12½-in. casing.
H. F. Wurtz' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW, Sec. 16, Blk. 46, Twp. 3s, G.M. M.Br.&A. Sur.	Shut down 3,280 ft.

EL PASO COUNTY

Tri-State Oil Co.'s No. 1 Bobadella, 1,325 ft. from S and E lines Sur. 254, S.F. No. 7,247	Drlg. 1,730 ft.

(Continued on Page 87)

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending October 19

CARSON COUNTY

Company, well, farm name, section and block—	Remarks:
Empire G. & F. Co.'s No. 1 Poling, 1,320 ft. S and W, Sec. 28, Blk. Y-2, T.T.R.R. Sur.	S.D. 2,725 ft.; T.P. 2,515 ft., 12,800,000 ft. gas.
Magnolia Pet. Co.'s No. 1 Connell, 330 ft. N and E, SE, Sec. 66, Blk. 4, H.&G.N. Sur.	Drlg. 2,425 ft.
Texhoma Nat. Gas Co.'s No. 1 Harrison, center NW, Sec. 40, Blk. 4, I.&G.N. Sur.	Rigging up standard tools.
Texhoma Nat. Gas Co.'s No. 1 Dover, 1,335 ft. from S, 656 ft. from W, Sec. 81, Blk. 4, I.&G.N. Sur.	Drlg. 825 ft.
Texhoma Nat. Gas Co.'s No. 1 McLaughlin, center NW, Sec. 61, Blk. 4, I.&G.N. Sur.	Drlg. 1,940 ft.
Texhoma Nat. Gas Co.'s No. 2 Schoffer, center SE, Sec. 64, Blk. 4, I.&G.N. Sur.	Set 10-in. csg. 1,130 ft.

CHILDRESS COUNTY

C. L. Sloan et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands	T.D. 5,000 ft.

COLLINGSWORTH COUNTY

Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur.	S.D. 2,508 ft.
Downey et al's No. 1 Beasly, SE cor. SW SE, Sec. 95, Blk. 15, H.&G.N. Sur.	Rigged up.

DEAF SMITH COUNTY

Western Union Oil Co.'s No. 1 Farwell, center NW, Sec. 18-3n-2e	Location.

GRAY COUNTY

Anderson et al's No. 2 Vollmert, 330 ft. N and W, SW, Sec. 140, Blk. 3, I.&G.N. Sur.	Rig.
Back & Barber's No. 1 Back, 660 ft. from S and 330 ft. from W, Sec. 140, Blk. 25, H.&G.N. Sur.	Rigging up rotary.
Boyce et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur.	Spudded and S.D.
Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur.	S.D. 2,160 ft.
Parton Holt and Shell Pet. Corp.'s No. 1 Morse, 330 ft. S and E, Sec. 6, Blk. 26, H.&G.N. Sur.	Set 8-in. csg. at 1,675 ft.
Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-2, H.&G.N. Sur.	Drlg. 2,930 ft.; 6,000,000 ft. gas at 2,825-50 ft.
Magnolia Pet. Co.'s No. 1 Arnold, 330 ft. from S and E, Sec. 149, Blk. 3, I.&G.N. Sur.	Location.
Magnolia Pet. Co.'s No. 1 Heaston, NE cor. S½ NE, Sec. 164, Blk. 3, I.&G.N. Sur.	Drlg. 510 ft.

(Continued on Page 87)

It takes selling to make a sale today—the buyer is in the saddle

But buyers can be sold the products of Dubbs cracking—all the products

It's no trick to sell Dubbs cracked gasoline—that brings a premium

Dubbs cracked fuel oil can be sold readily, too, when you show the buyer how much better it is than the straight-run product It has more heat units per barrel—lower cold test—lower viscosity

Coke from Dubbs cracking units is firing hundreds of furnaces over the country and there are hundreds more that ought to be using it

Cracked gases can be sold at a good price today, too

Universal Oil Products Co
Chicago Illinois

Dubbs Cracking Process
Owner and Licensor

Consumption of Gas Increased in 1930

Texas Continues as Leading Producing State. Interstate Transportation Shows an Exceptionally Rapid Growth

Although the natural gas industry in 1930 fell far short of repeating the expansion of 1929, it established a new high production record of 1,943,421,000,000 feet, says the U. S. Bureau of Mines, Department of Commerce, in a statement prepared by G. R. Hopkins, economic analyst. This represents an increase over the previous year of 1.3 per cent, which, though considerably below the average annual increase for the past decade, represents a creditable showing in view of the curtailment in the production of crude petroleum. Exports of natural gas to Canada and Mexico in 1930 amounted to 1,798,000,000 feet, a material increase over the previous year. This resulted chiefly from increased deliveries to Mexico following the completion of the pipe line from the Jennings Field in Texas to Monterrey. During the year, 21,000,000 feet of natural gas were piped into Montana from Canada.

Adding the imports and deducting the exports gives 1,941,644,000,000 feet as the total consumption within the United States in 1930. The number of domestic (including commercial) users of natural gas continued to increase and amounted to 5,448,000, a gain over the previous year of 7 per cent. This increase reflects the completion of the major part of the system from the Monroe-Richland Field to Atlanta and the addition of numerous branch lines to existing systems. Although the average consumption per domestic user was less than in 1929, the proportion of the total consumption utilized for domestic purposes rose from 19 to 20 per cent and the percentage used for industrial purposes accordingly fell from 81 to 80 per cent, the same as in 1927 and 1928. The quantity of gas treated for the recovery of natural gasoline in 1930 amounted to 2,088,788,000,000 feet, or 107 per cent of the quantity produced and delivered to consumers. The excess treated represents largely gas produced from oil wells which are so located as regards the fuel markets that the residue gas is valueless and is wasted. The average prices of natural gas at the wells continued to decline and in 1930 amounted to 7.6 cents per 1,000 feet as compared with an average of 8.2 cents in 1929. This decline in natural gas prices at the wells was reflected in the prices paid by the largest users, the industrial consumers, who paid an average of 11.3 cents in 1930 as compared with 12.2 cents in 1929.

Gas Production

The total production of natural gas in the United States during 1930 amounted to 1,943,421,000,000 feet, an increase over 1929 of 25,728,000,000 feet, or 1.3 per cent. This total does not include the quantity of gas blown into the air in flush oil fields.

Texas, the leading natural gas producing State in 1929, strengthened its hold on first place in 1930 when its output was 517,880,000,000 feet, an increase over the previous year of 11 per cent. This gain was due principally to increased output from the Panhandle, the starting point for the majority of the large pipe line systems which originate in the State. Production in Oklahoma, the second ranking State, showed a small decrease in 1930 as the decline in output of the Seminole district exceeded the gain in the Oklahoma City Field. California also reported a slight decline in natural gas production in 1930; this resulted chiefly from the natural decline of the oil fields and the small number of new discoveries. Production in Louisiana increased in 1930 as an afthermath to the expansion of pipe line systems originating in the Monroe and Richland Fields. Some of the states reported material declines in output of natural gas in 1930; the most notable were West Virginia and Pennsylvania, which rank fifth and sixth, respectively. Production in Michigan in 1930 was less than half the 1929 total, evidence of the rapid decline of the Muskegon Field and the failure of drilling to uncover other sources of supply.

Gas Well Completions

Because of the curtailment in drilling, the number of gas discoveries in 1930 undoubtedly fell below the 1929 total. However, the number of gas wells completed was practically the same for the two years—2,866 in 1930 as compared with 2,870 in 1929. The total initial production of the 1930 completions probably constituted a new record as an increasing proportion of the wells was drilled with the object of establishing a gas reserve to insure the operation of the various large pipe line systems. The possibilities of Kentucky as an important source of supply were seriously considered and the number of gas wells brought in during 1930 was practically double the 1929 completions.

A substantial gas reserve was set up in the Hugoton Field of Southwest Kansas through the completion of approximately 80 wells in 1930. This field will be used principally as a supplementary source of supply for several of the pipe line systems running north from the Texas Panhandle. The Jackson Field of Mississippi came in for considerable development work in 1930 and a number of very large wells were completed. This reserve will be used to supply the pipe line system running into Alabama and Georgia.

The completion of comparatively large wells near Tioga, Pa., and Dundee, N. Y., in 1930 greatly increased interest in the possibility of supplying New York City and New England with natural gas.

The total consumption of natural gas, computed by deducting exports to Canada and Mexico from the total of production and imports, amounted in 1930 to 1,941,644,000,000 feet, an increase over 1929 of 1.3 per cent. The practice of storing gas in depleted sands in periods of low consumption progressed during the year but the amount stored in 1930 was not regarded as large enough to affect the consumption figures. Of the total consumption, 1,565,237,000,000 feet, or 80 per cent, was consumed for industrial purposes, and 376,407,000,000 feet, or 20 per cent, was utilized by domestic and commercial consumers. In comparison with 1929, these data indicate a slight growth in relative importance of the domestic consumption.

Domestic Consumers

The number of domestic consumers of natural gas showed a material increase in 1930, although the gain was much less than that experienced in 1929. The number of domestic consumers in 1930 amounted to 5,448,000, an increase over 1929 of 350,000, or 7 per cent. Beginning with 1930, the classification of domestic consumers was divided into two classes, namely, the strictly domestic or home users, and commercial consumers, such as stores and shops. The number of strictly domestic users amounted to 5,095,500, the number of commercial consumers totaled 352,680, a ratio of about 14 to 1. Three States, namely, Alabama, Georgia and Nebraska were added to the consuming states in 1930, which brings the total, exclusive of Alaska, to 30.

The total consumption of natural gas for domestic and commercial purposes in 1930 amounted to 376,407,000,000 feet, an increase over the previous year of 5 per cent. The average consumption per domestic consumer continued to fall off and for 1930 amounted to 69,100 feet as compared with 70,600 feet in 1929. On the basis of the prevailing prices, each domestic customers paid an average of $4.39 for natural gas in 1930, as compared with an average of $4.38 in 1929. The increased cost in the face of a drop in the total used resulted from an increase in the average price.

The gas burned by domestic and commercial consumers in 1930 had a total value of $239,173,000, or an average of 63.5 cents per 1,000 feet. This average price, the highest so far recorded, represents an increase of 1.5 cents over 1929. The strictly domestic users paid an average of 67.4 cents per 1,000 feet in 1930, as compared with an average of 46.8 cents for the commercial consumers. The highest price recorded for the strictly domestic users in 1930 was $1.417 per 1,000 feet paid by consumers in Georgia; the lowest was $0.446 per 1,000 feet, paid by the Wyoming consumers.

Industrial Consumption

The total consumption of natural gas for industrial purposes in 1930 amounted to 1,565,237,000,000 feet, an increase over 1929 of .5 per cent. Of the total, 723,165,000,000 feet, or 46 per cent, was used for field purposes; 266,625,000,000 feet, or 17 per cent, was used in the manufacture of carbon black; 120,290,000,000 feet, or 8 per cent, was burned as fuel by electric public utility power

(Continued on Page 85)

SUMMARY OF NATURAL GAS STATISTICS, 1930

State—	Production: Quantity (millions of cu. ft.)	Production: Estimated average value at wells per M cu. ft. (cents)	Production: Average value at points of consumption M cu. ft. (cents)	Consumption: Domestic (incl. commercial): Thousands of consumers	Consumption: Domestic (incl. commercial): Consumption (millions of cu. ft.)	Consumption: Domestic (incl. commercial): Average value at points of consumption per M cu. ft. (cents)	Consumption: Industrial: Field (drilling, pumping, operating gasoline plants, etc.): Millions of cu. ft. (estimated)	Consumption: Industrial: Field (drilling, pumping, operating gasoline plants, etc.): Value (thousands of dollars) (estimated)	Consumption: Industrial: Manufacture of carbon black: Millions of cu. ft.	Consumption: Industrial: Manufacture of carbon black: Value at points of consump'n (thousands of dollars)	Consumption: Industrial: Fuel at petroleum refineries, electric public-utility power plants, cement plants, and other industrial: Millions of cu. ft.: Petroleum refineries	Electric public-utility power plants	Portland cement plants	Other industrial trial	Value at points of consump'n (thous. of dollars)*
Alabama	.....	....	....	20	423	110.2	.....	.....	.....	.....	.....	.....	(†)	†732	$167
Arkansas	15,585	5.5	19.0	66	8,238	48.3	13,455	$1,207	.....	.....	3,639	1,544	(†)	†11,255	2,046
California	334,789	7.5	20.6	1,330	47,519	86.9	210,794	16,128	.....	.....	23,322	26,173	(†)	†26,981	11,626
Colorado	3,312	2.4	28.9	87	5,141	76.0	976	33	.....	.....	5	.....	(†)	†10,520	1,507
Georgia	.....	....	....	57	1,168	138.2	.....	.....	.....	.....	.....	.....	.....	329	128
Illinois	2,890	8.3	17.5	13	115	102.6	2,806	235	.....	.....	149	.....	.....	6,532	1,323
Indiana	1,217	29.5	55.5	20	978	73.9	28	3	.....	.....	.....	1	.....	1,508	740
Kansas	37,630	7.9	33.1	186	17,320	59.4	10,490	1,182	.....	.....	4,526	12,636	9,649	21,014	8,044
Kentucky	28,023	15.3	34.6	160	10,674	48.1	1,033	199	.....	.....	.....	.....	.....	4,260	1,261
Louisiana	278,341	3.0	12.9	128	8,574	59.0	22,408	1,055	85,226	2,395	13,699	18,557	.....	35,632	7,719
Michigan	2,075	11.2	30.1	11	355	107.6	664	70	.....	.....	.....	.....	.....	1,056	173
Mississippi	179	5.6	48.0	16	684	92.6	6	0.4	.....	.....	.....	239	.....	806	196
Missouri	1,064	6.8	30.6	122	9,158	78.7	3	0.4	.....	.....	2,422	966	(†)	†13,573	3,120
Montana	10,060	5.3	29.7	19	3,635	42.9	764	76	684	14	146	592	.....	2,304	586
Nebraska	.....	....	....	24	180	95.6	.....	.....	.....	.....	.....	263	(†)	†655	178
New Mexico	9,497	3.3	13.4	6	428	61.7	3,142	134	.....	.....	4	250	.....	111	100
New York	9,624	33.1	66.8	273	16,915	68.3	499	171	.....	.....	200	25	.....	1,352	957
Ohio	63,394	17.1	57.6	1,239	90,879	63.7	5,203	1,256	.....	.....	12	4,275	.....	25,447	13,405
Oklahoma	348,116	5.1	13.7	326	28,206	48.8	248,870	16,255	(†)	(†)	11,664	6,678	(†)	†25,433	†5,721
Pennsylvania	88,706	29.0	50.2	637	51,974	61.4	6,290	2,091	.....	.....	1,121	62	.....	43,771	17,780
South Dakota	98	8.2	32.7	5	1,172	56.0	.....	.....	.....	.....	.....	.....	(†)	†1,733	309
Tennessee	24	12.5	37.5	39	2,246	76.7	.....	.....	.....	.....	.....	3,856	.....	1,232	944
Texas	517,880	3.6	13.9	522	41,058	66.1	163,506	15,404	176,418	3,441	25,792	43,885	11,162	64,339	24,697
Utah	393	2.0	31.3	19	1,067	77.5	.....	.....	392	8	.....	.....	.....	2,586	425
West Virginia	144,180	18.0	46.2	173	23,824	36.9	13,379	2,871	(†)	(†)	1,653	94	.....	†23,932	†7,058
Wyoming	43,219	3.7	9.9	15	3,517	40.6	18,908	747	(†)	(†)	19,488	194	.....	†7,112	†1,104
Other	125	8.0	40.8	24	859	76.0	2	0.2	3,905	144	.....	.....	20,445	204	56
Total 1930	1,943,421	7.6	21.4	5,448	376,407	63.5	723,165	59,118	266,625	6,002	98,842	120,290	41,256	315,059	111,226
Total 1929	1,917,693	8.2	21.6	‡5,098	359,853	62.0	705,083	68,352	261,107	5,108	103,729	112,707	41,643	333,329	116,521

*Includes value of gas used at petroleum refineries, electric public utility power plants, and cement plants. †Included under "Other States" for United States total and under "Other Industrial" for State total to avoid revealing figures of individual operators. ‡Revised.

The BRIDGEPORT Shopper's PAGE

Every week has its own opportunities, when you "Watch The Shopper's Page" . . . Dependable Used Tools, Supplies, Drill Pipe, Rotaries, etc., are passing through our Dependable Used Tool Department in a never-ending stream—and going out to Operators at money-saving prices . . . If you don't find what you need here, watch the next Shopper's Page—or better, call a Bridgeport Branch man in on your problem.

A FEW BARGAINS

1—Ajax Steam Engine, 13"x14", completely rebuilt	$650.00	
2—1½ KW Generators, our factory overhauled	75.00	each
1—New Crown Block, Regan, 5 sheave	1400.00	
1—Regan Traveling Block, 4 sheave	1750.00	
1—Twin Johnson Engine, 12x12	1500.00	
1—New 24" Cable Bit	.06	pound
2—Feed Pumps, 10x4½x10	300.00	each
1—25 H. P. Superior Gas Engine and Reverse Clutch, completely overhauled, F.O.B. Kilgore	350.00	
1—12,000 Lucey Pump, F.O.B. Kilgore	850.00	
4—73 H.P., 180 WP Broderick Boilers	950.00	each
100—Good re-worked 6⅝" Tool Joints	7.50-15.00	each
10 sets—11" rebuilt Hughes Cones	25.00	each
5,000 feet—6¼" Seamless Casing, F.O.B. Wichita (Very Fine Grade)	.70	ft.
4,000 feet—very best 4" Drill Pipe with Tool Joints	1.20	ft.

ACTION NECESSARY

The theory that the depression is "in the minds" of the people does not satisfy Oil Men whose troubles are far from imaginary. There must be something *concrete* holding things back.

Mismanagement of the world's Credit System is surely one of the causes of slow business. Large and small financial houses must come to some agreement regarding a basis of fair dealing. ACTION is necessary, fixing values—or at least some assurance as to where the bottom is. Our credit machinery will begin to function as soon as it has assurance that the losses and liquidation are well over.

Insist upon your representatives getting back of policies which will influence other Nations to again freely trade with us—insist upon the protection of American rights. If only the strongest survive—a few large corporations and master minds—it gives most of us a slim chance.

ACTION IS NECESSARY—WHICH WILL BENEFIT THE MASSES

Bridgeport Rentals Reduce Operating Costs

Bridgeport has many tools and considerable equipment which you may rent. If you decide to buy before returning to our store you may do so, at the regular sales price without paying any rental.

Rental Drill Pipe

6⅝", 4" and 3½" Drill Pipe with Tool Joints on may be rented by the day or job. One joint or the complete string. Bridgeport's prices are lowest considering quality and service.

New and Used Drill Pipe for Sale

All sizes carried in stock ready for immediate delivery. Carload shipments of new Pipe from Memphis or Houston at lower prices. Bridgeport delivers or allows for delivery on all Used Drill Pipe. Get our prices and terms.

Rental of Rotary Equipment

Any units in stock or a complete Rotary can be rented at reasonable prices. Boilers, Drawworks, Engines, Pumps, Rotary Tables and Boiler Feed Pumps on hand. BRIDGEPORT stands back of its deals and does not misrepresent.

Rental Rotary Fishing Tools

Overshots, Milling Tools, Tapered Taps and other tools carried for Rental.

Rental Swan Underreamers

Both New Type and Regular rented or sold. Special concessions on tools shipped by Public Carriers; rental begins when tool taken from station, and stops when returned to station. Distance from store is no loss to you. You can depend on BRIDGEPORT tools—always ready—always right. Call or wire our expense.

Cable Tools

Everything needed always in stock. Hychrome Bits and Stems; prices so low you positively cannot afford to keep "old stuff" on the job.

Hychrome Casing Shoes

Sizes up to and including 10" carried in stock. The only real quality shoe on the market—proven by years of use. Prices and further information gladly furnished.

Aquagel and Baroid

The recognized Rotary Mud. Wire or call—at our expense—any Branch in Texas, Oklahoma, Kansas, Colorado or New Mexico.

WE WILL BUY

10,000 feet of 7" O. D. 24-lb. Seamless Casing. Must be good grade. Write Dependable Used Tool Dept., Wichita, Kans.

BRIDGEPORT SLUSH PUMP LINERS

			Per Set
Wilson-Snyder	14x7x18	7¼ Bore	$82.50
Wilson-Snyder	14x7x18	7 Bore	85.00
Johnson Gumbo	12x6¼x16	7¼ Bore	80.00
Buster	14½x7½x18	6¾ Bore	44.30
Union Tool	14x7¼x14	7¼ Bore	67.40
Lucey	14½x7½x16	7½ Bore	88.90
Lucey	15x7¾-18	7½ Bore	110.00
Union Tool	14½x7½x18	7½ Bore	70.00

Bridgeport Products Can Be Purchased Through Your Supply Dealer

Branches

Wichita, McPherson, Russell and El Dorado, Kansas; Oklahoma City and Seminole, Okla.; Pampa and Kilgore, Texas.

BRIDGEPORT MACHINE COMPANY
Wichita, Kansas

Foreign Representatives

LUCEY PRODUCTS CORPORATION
No. 3505 Woolworth Bldg.,
New York, N. Y.

Development of Gasoline Specifications

Improvement in Quality of Motor Fuels Has Been So Rapid and Extensive, Regulations Have Failed to Keep Apace

By C. K. Francis
Technical Editor

The petroleum refiner of the early days of the industry did not see any value in gasoline. It was a waste product, an annoyance to the industry for over 40 years, the main object of the refiners being to manufacture a good grade of illuminating oil, a product safe to burn in a lamp, and one which gave off no volatile vapors that might be the source of fire or explosion. The fact that the portion of petroleum which we now call gasoline, fractioned as a preliminary step to the separation of the illuminating oil, was recognized by the inventors as a veritable storehouse of energy suitable for the fuel of the internal combustion engine, was of far reaching importance. Without this product the development of the automotive industry would have been long delayed, and the tremendous growth of the petroleum industry during the past 30 years would not have been possible without the large consumption of gasoline in the automobile engine.

Commercial Use Established

With no commercial use for gasoline there was little reason to study its composition, to make exact descriptions of it, or to define its properties. The very nature of modern gasoline illustrates what may be done through scientific efficiency and standardization. It was on July 4, 1894, that Elwood Haynes, first demonstrated a gasoline powered vehicle of his own invention at Kokomo, Ind. This was the beginning of a major industry which in a few years was to require each day a volume of the waste product, gasoline, much larger than the total daily production of petroleum in the United States during the year 1894. The records show that in 1899 there were 3,700 automobiles in the United States. This number grew with each year until the 1930 records listed 26,746,184 and a total of 35,811,623 automotive vehicles for the world. The present average daily consumption of gasoline in the cars of the United States is over 1,000,000 bbls.; the total production of crude oil for 1900 was approximately 174,000 bbls. a day.

It was fortunate that the crude oil of the nineties yielded a gasoline of high volatility, because it was suited to the needs of the inventor and was available in large quantities at a low price. The gasoline of the early days would not give very satisfactory service in the motor of today. The automobile of 1900 operated at the rate of a few miles per hour, the car of today will travel 60 miles per hour for many hours and the record speed of 245.73 miles per hour has been attained. While the engine has been much improved an equal advancement has been made in the quality of the gasoline. From a product of indefinite quality it has become a substance of world wide importance, its properties well known and the several grades fully described by means of scientific specifications.

Properties

The first gasoline motors were similar in principle to the gas engine and required a fuel that would gasify easily. The extremely volatile nature of the gasoline then made seemed to make it the ideal fuel; it was almost gas. The carburetors were arranged to bubble air through the gasoline, then the gas so obtained was mixed with additional air to be exploded in the cylinder of the engine. Difficulties that we now know were caused by the mixture being too rich, were frequent. After driving the car a short distance it was a common practice to rest a while for the engine to cool off. Some gasolines gave better results than others. Good performance in a car became the standard by which to judge the quality of gasoline, but this was soon recognized as unreliable and impracticable.

Many efforts were made to prepare tests for the grading of gasoline. Density, odor and color, were the first properties to be used as a guide. The Baume hydrometer, for liquids lighter than water, was used when determining density. This instrument is scaled up from 10, the density of water; as the specific gravity decreases so the most volatile or light liquids have a density shown in the higher numbers. Kerosene was usually around 45 Be., while most of the gasoline was 70° or more; hence the expression "high test." Subsequent studies have taught us that density alone is of little value for predicting performance of the gasoline. The odor of gasoline, used for motor fuel purposes, has never been of importance to the consumer. Color is certainly the most prominent property of any liquid. Gasoline being the lightest of the liquids obtained from petroleum, or by extraction from natural gas, should be free from those heavy oils, asphaltic and unsaturated bodies which tend to form yellowish to brownish tints in mineral oils. Traces of these substances may find their way into gasoline through faulty refining. However, a gasoline satisfactory in all other respects should not be rejected because of any slight appearance of yellowish and brownish tinges.

Density, odor, and color are of importance in the marketing of gasoline. The most important of these to the consumer is color. A dark, muddy, off-colored product cannot be sold in competition with a colorless gasoline. The commonly accepted market requirement for color is 25 Saybolt.

Gravity

The density, or gravity, has from the early days of the industry been the means for grading the different petroleum products. It is a valuable control test for the refiner. U. S. Census Report 70, on "Petroleum Refining," by C. E. Munroe, published in 1905, explains the meaning of gasoline at that time: "Naphtha and gasoline embraces pentane, boiling point 100.4° F., real specific gravity 0.625, which is used as a standard of light in photometric work; petroleum ether, boiling point 104° F. to 158° F., specific gravity 0.65 to 0.66 or 85° to 80° Be., which is sometimes known as Sherwood oil, and is used as a solvent for caoutchouc and fatty oils, and for carburetting air in gas machines; 76° gasoline, boiling point 158° to 194° F., specific gravity 0.66 to 0.69 or 80° to 75° Be., known as 680 spirit, motor spirit, petrol, carburine, and boulevard gas fluid and used in naphtha lamps and internal combustion engines, in the extraction of oil from seeds and fat from garbage and wool, and in carbureting water gas; naphtha, boiling point 177° to 230° F., specific gravity 0.69 to 0.70 or 76° to 70° Be., known also as Danforth's oil, ordinary spirit (when in the condition of untreated distillate), deodorized spirit (when purified), and city naphtha, as used as petrol in motor cars, for burning in vapor stoves and street lamps, as a solvent for resins in making varnishes, and in the manufacture of oilcloths; stove naphtha, specific gravity 0.70 or 70.4° Be.; ligroin, boiling point 176° to 248° F., specific gravity 0.71 to 0.73 or 67° to 62° Be., used as a solvent in the chemical laboratory and in pharmacy and for burning in sponge lamps; benzine (deodorized), boiling point 248° F. to 302° F., specific gravity 0.73 to 0.75 or 65° to 57° Be., used as a substitute for turpentine for cleaning printers' type, and for dyers', scourers', and printers' uses.

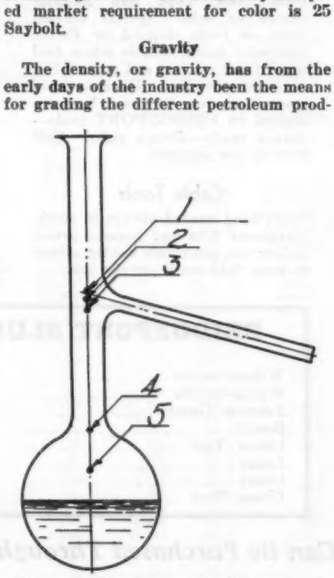


Figure 1—Thermometer in different positions.

"In the refinery all of the above mentioned fractions may be included in the substances known as A-naphtha, specific gravity 0.74 or 64° to 60° Be.; B-naphtha, specific gravity 0.72 or 68° to 64° Be.; and C-naphtha, specific gravity 0.70 or 80° to 68° Be. All petroleum distillates having a specific gravity above 60° Be. may be styled naphtha and gasoline."

Gasoline was purchased simply on a gravity specification for some years, but with the rapidly growing demand for gasoline and its sale in great volume, accompanying the increasing number of automobiles, it became apparent that some other method would have to be devised for judging the quality. Difficulty in starting the engine, the production of smoke, the deposition of carbon, uniform performance, and the big problem of speed, brought up questions that could not be answered by explanations of differences in gravity. Considering the boiling points, rate of evaporation or fractional distillation, it appeared that some kind of a distillation test would give more reliable information. The greatest progress made in perfecting the modern motor fuel was the result of the standardization of this test and the specifications which made use of the data obtained by distillation test.

Distillation Test

The original data to be included in the distillation test were: The determination of the temperature at which the gasoline boils, or more accurately when the first drop of the distillate falls from the end of the condenser tube, this point being known as the initial boiling point; the rate of distillation, determined by recording the temperature for each 10 per cent of the distillate; the dry point, or the temperature when there is no liquid remaining in the bottom of the flask; finally, the maximum temperature, or the highest temperature reached as the end of the distillation is approached, it is commonly called the endpoint. Loss and recovery were later included.

Developing Test

A complete statement of the steps made in perfecting the distillation test would require many pages and would hardly be worth the while; however, a few examples may be of interest and of value.

The first apparatus for making the distillation test included a sand bath upon which the flask rested; covering the flask with sand helped to give a more uniform rate of boiling. This was followed by a series of sections of asbestos boards which were set about the flask as a shield. The final form was a shield or hood from

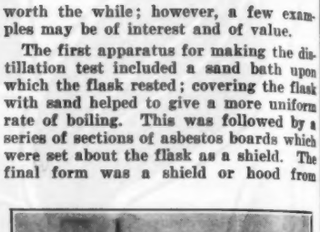


Figure 3—Distillation apparatus before standardization.

which the present standard shield was developed. The capacity of the flasks in use by the different refiners and inspectors prior to 1918 ranged from 100 cc. to 1,000 cc. The quantity of gasoline examined varied accordingly. The position of the bulb of the thermometer in the distilling flask was found to have a material influence on the results. It was necessary to reduce these and many more variables to a definite condition before uniform results could be expected.

Some of these factors were studied in several experiments, the essential conditions of which are outlined in the following:

Method A—Measure 100 cc. of the sample in a pipette and place it in a 100 cc. distilling flask. Have a small quantity of the sand in the sand bath. Connect the flask to the condenser so that there will be exactly 4 inches between the flask and the condenser when measured on the under side of the vapor tube. Add cold sand to the sand bath just sufficient to be level with the surface of the liquid in the flask. The top of the thermometer bulb should be on a level with the upper side of the vapor tube. Adjust the flame so that the first drop will fall from the end of the condenser tube—initial boiling point—in 15 to 25 minutes, and continue the distillation at the rate of 4 or 5 cc. a minute.

Method B—The procedure is the same as for method A except as follows: (1) A 200 cc. flask is used and it is covered with sand leaving a small space through which the bottom of the flask may be observed. (2) The thermometer is placed with the top of the bulb level with the lower side of the vapor tube. Rate of heating same as under method A.

DISTILLATIONS ON SAND BATH
When 100 and 200 cc. Flasks With Thermometer Bulbs High and Low Are Used. All Temperatures Are °F.

Method—	Quantity cc.	First drop minutes	Initial boiling point	Dry point	Maximum end-point
A	100	16.5	136	458	465
B	100	14.5	122	462	472
A	100	23.0	132	454	465
B	100	21.5	117	464	473
A	200	15.5	134	456	463
B	200	14.5	120	462	471
A	200	24.5	130	455	466
B	200	22.0	116	462	476

The data illustrate the varying results obtained when the conditions of the dis-

tillation test are varied. Rapid heating tends to cause a high initial boiling point. Increasing the size of the flask favors a lower initial but consistent checks of this temperature are difficult to obtain. In the B series the superheating influence of the sand bath is evident.

The position of the thermometer in the flask was a factor over which there was considerable dispute. A series of tests was made in which 60/61 gasoline was distilled in a 500 cc. flask, the thermometer being set as shown in Figure 1, to demonstrate the importance of this detail. The data are given in the table:

DISTILLATIONS OF 60/61 GASOLINE WITH THERMOMETER IN VARIOUS POSITIONS

(Temperatures °F.)

Position—	I.B.P.	10%	20%	50%	80%	90%	95%	Max
1—Bottom of bulb upper side of tube	110	162	186	232	284	314	338	382
2—Top of bulb opposite center of tube	110	164	188	232	286	316	338	384
3—Top of bulb lower side of tube	133	182	200	241	288	318	342	388
4—Top of bulb at bottom of neck	132	182	200	242	290	320	344	390
5—Bottom of bulb ½ inch above liquid	136	184	203	242	292	322	348	390
	136	186	204	244	294	326	354	394
	152	184	210	250	299	332	354	406
	154	186	208	250	300	334	362	406
	158	194	212	250	306	336	366	414
	156	194	212	252	304	334	364	416

The lower the position of the bulb of the thermometer the higher the temperature observed. The correct position is clearly that of position 3, where the bulk of the mercury is in the direct path of the escaping vapors.

Between 1912 and 1918 several state and municipal bodies adopted regulations for controlling the quality of gasoline. Most of these regulations specified either a gravity range or simply a minimum gravity. The Colorado law specified that gasoline should not contain more than 5 per cent solid matter. Less than half a dozen states made reference to distillation properties; several mentioned a limiting residue at a specified temperature—South Dakota, for example, required that 60 gravity gasoline should not exceed 10 per cent residue at 300° F. Information was collected and published in several bulletins of the U. S. Bureau of Mines. However, there was no uniform action or general agreement, so numerous testing methods and specifications for gasoline were proposed.

Detroit Specifications

The city of Detroit adopted an ordinance in which specifications for gasoline were given and a distillation test described.

"For the purpose of this ordinance gasoline sold or used in the city of Detroit shall be classified and graded as follows:

"Detroit city standard gasoline shall be a liquid hydrocarbon obtained by straight distillation or by the cracking process or by blending of the two and having an endpoint or boiling temperature not exceeding 450° F. and shall distill over at least 20 per cent at 220° F. and 50 per cent at 300° F., when tested by the distillation test elsewhere provided for in this ordinance.

"Any liquid hydrocarbon exceeding the limit of 450° F. for the endpoint or of final boiling temperature; or shall distill off less than 20 per cent at 220° F. shall be known as mixed gasoline-kerosene, or 'Mixed G-K,' and the boiling point of the last fraction determined by the distillation test shall be prominently displayed when this liquid is placed on sale.

"The gasoline test required by this ordinance shall be as follows:

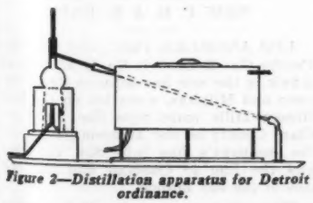


Figure 2—Distillation apparatus for Detroit ordinance.

"The flask shown in Figure 2 has a total capacity of 700 cc., a charge of 500 cc. of liquid to be tested is used. Heat is applied rapidly until the material begins to boil slightly, this heat is then moderated so that distillation begins slowly. Distillation is carried on at such a rate that the drops from the end of the adapter just merge into a stream. The fractions are determined each 10 per cent of contents of flask, or each 50 cc. When the gasoline reaches the 50 cc. mark on the receiving graduate the temperature in the neck of the flask is noted. When about 10 cc. are left in the flask as near as can be estimated the temperature is noted, and this temperature is called the maximum or 98 per cent off. The initial boiling point is the temperature noted when the fifth drop falls from the adapter into the graduated cylinder."

There were several features indicated in the Detroit ordinance which suggested improvements over the ordinary apparatus for making the distillation test. The flask was well supported, the flame protected by means of an asbestos shield, 9"x9"x10", the rectangular condenser box, 6"x30"x13", with the long copper tube, furnished ample condensation conditions, the position of the thermometer bulb was indicated, and the importance of a uniform temperature was suggested for the condensing bath by stipulating that the box was to be filled with ice and water.

Bureau of Mines

The U. S. Bureau of Mines reported for the year 1915, in Technical Paper 163, on the quality of 52 samples of gasoline, the gravity of which varied from 56.2 to 80.2, averaging 63.2 as examined. The distillation test data were reported in the form of seven fractions—up to 50° C., then increasing by 25° C. up to 200° C.; from 122° F. to 392° F. These distillations were made in a 300 cc. flask with a fractionating column connected to a vertical condenser. Other determinations were unsaturated hydrocarbons, calorific value, and engine tests for power.

When discussing suggested specifications it was stated, on page 39 of this bulletin: "To summarize the matter of gasoline specifications, it may be said that the conditions under which the gasoline is to be used should be considered and then requirements should be outlined for as cheap a motor fuel as can be consumed with approximate maximum efficiency. If engine conditions are adjusted to attain this condition, a cheap gasoline will yield as much or even more power than the lighter and more expensive 'high test' products. In addition the results indicate that both cracked and blended casinghead gasolines may be utilized to as great advantage as straight refinery products."

A paper read before the Western Oil Jobbers Association, St. Louis, March 21, 1917, by A. A. Ashworth, called attention to the importance of the distillation test: "Up to the present time almost the only basis on which gasoline has been bought and sold is that of gravity. The purchaser required gasoline of a certain gravity with sometimes the added requirement that it should be 'straightrun.' The tendency now is to discard the gravity test as applied to gasoline and to substitute for it a distillation test. In order that a distillation test may give similar figures when the test is made by the buyer or seller it is important that the test be made in a specified manner and with standardized apparatus."

The American Society for Testing Materials, Year Book, 1915, page 568, suggested the distillation method then in use for the examination of turpentine products, as suitable for making the distillation test of gasoline. (See Figure 3.) A similar apparatus was described by E. W. Dean, of the Bureau of Mines, in Technical Paper 166, 1917.

Wilson's Order

President Wilson, on July 31, 1918, issued an order to the United States Fuel Administrator to prepare standard specifications for petroleum and its products to be used for purchasing such materials by the United States Government. As a result of this order uniformity of testing methods and specifications for many petroleum products has resulted. This work was initiated by the federal specifications committee in consultation with technical advisers and the advisory board, composed of representatives from the industry, trade associations, and technical societies.

The United States Fuel Administration, oil division, issued October, 1918, the report of committee on standardization of petroleum specifications, Bulletin No. 1. It contained specifications for aviation gasoline, export, fighting and domestic grades, and motor gasoline. The methods adopted for testing were those as published in Technical Paper 166, of the Bureau of Mines. These specifications are outlined in the table:

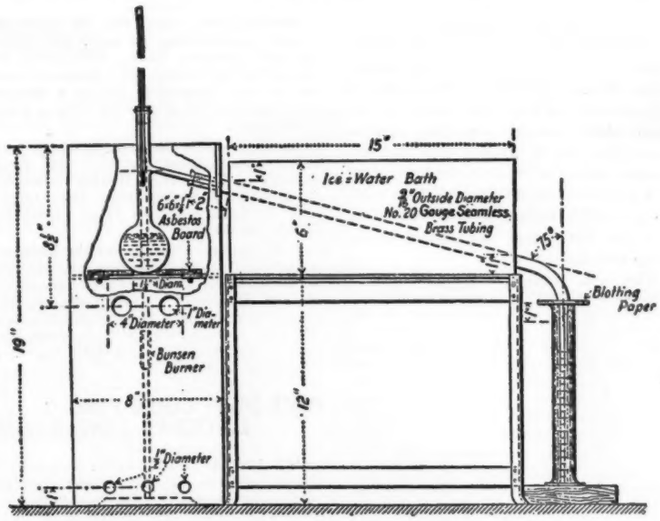


Figure 4—A.S.T.M. apparatus for distillation of gasoline.

OUTLINED SPECIFICATIONS FOR GASOLINE, OCTOBER 2, 1918

Aviation Gasoline

Color—Water white for all grades.
Foreign matter—Free from acid, water and suspended matter.
Doctor test—Negative.
Corrosion and gum—No gray or black corrosion in a copper dish. No weighable gum.

Distillation— Per cent off	Temperature °F. Export	Fighting	Domestic
5	122/140	140/158	122/167
50	203	203	221
90	257	235	311
96	302	257	347
Endpoint	329	284	...
Recovery %	96	96	96
Loss %	2	2	2

Motor Gasoline

Color—Not required.
Foreign matter—Free from water and all impurities.
Doctor test—Not required.
Corrosion and gum—Not required.

Distillation test	Temp., °F.
Per cent off:	
I.B.P.	140
20	221
45	275
90	356
Endpoint	428
Recovery %	95
Loss %	...

Methods were described by Doctor Dean, in Bulletin 166, for the testing of gasoline in more detail than had previously been attempted. A flask for a charge of 100 cc. was described by dimensions. The flask was supported on an asbestos board and heated through an opening 1¼ inches in diameter. The use of a sand bath was not approved. The condenser, thermometer, and a 100 cc. graduated receiver were specified. The method for making the distillation test provided that a 100 cc. sample should be distilled at the rate of 4-5 cc. per minute. The condenser box was filled with a mixture of water and cracked ice. The stipulation requiring the thermometer bulb to be covered with a thin film of absorbent cotton, later changed to 3 mgm., to prevent possible fluctuations in temperature and to prevent superheating of the bulb, was the cause of disputes and no little discussion, which continued until 1923, when this detail was discarded.

A.S.T.M. Research

The problems involving extensive research, investigations, and studies necessary for the perfection of apparatus and agreement on testing methods have been sponsored by Committee D-2 of the American Society for Testing Materials. This committee has always received the hearty co-operation of the Bureau of Mines and the Bureau of Standards of the United States Government. The standard methods which have been published in Technical Papers 323A and 323B of the Bureau of Mines are essentially the same as those developed by the A.S.T.M. The official apparatus for making the distillation test, from A.S.T.M. Tentative Standards, 1926, p. 388, also Technical Paper 323-B, p. 51, is shown in Figure 4. The American Standards Association, organized in 1928, originated in a committee representing five of the engineering societies appointed for the purpose of providing a clearing house through which technical societies, trade associations, or governmental departments could develop necessary standards for products and materials. The specifications for petroleum products, which have been adopted by many states, have been published by the Bureau of Mines in Technical Papers 323A and 323B. The specifications for gasoline as printed in 323A in 1924 are outlined in the table:

GASOLINE SPECIFICATIONS IN 1924

Aviation Gasoline

Color—Saybolt 25.
Doctor test—Negative.
Corrosion—Negative.
Gum—3 mg.

Distillation— Per cent off:	Temp., °F.	
5	122/149	132/167
50	203	221
90	257	311
96	302	347
Endpoint	329	374
Recovery %	96	96
Loss %	2	2
Acidity	none	none
Sulphur	0.10	0.10

Motor Gasoline

Color—Saybolt 16.
Doctor test—Not required.
Corrosion and gum—Not required.

Distillation test	Temp., °F.
Per cent off:	
I.B.P.	131
20	221
50	284
90	392
Endpoint	437
Recovery %	95
Loss	...
Acidity	...
Sulphur	0.10

Technical Paper 323B appeared in October, 1927, with no changes in the specifications for the aviation gasolines. The only change made concerning Motor Gasoline was to omit the color specifica-

(Continued on Page 100)

Pipe Line Construction News

MILLS EXPECT INQUIRY FOR CONTINENTAL LINE

By B. E. V. Luty

PITTSBURGH, Pa., Oct. 19.—Continental Construction Co. has been making plans for an extension to Milwaukee of the natural gas line from Texas to Chicago which recently went into commission. The line is 24-inch and the Milwaukee extension would be 20-inch, about 170 miles or some 30,000 tons. Pipe mills do not admit having formal inquiry for the pipe but expect the inquiry to develop any time.

The steel trade has strong hopes of general business improvement through the setting up and functioning of the National Credit Corp., there being a double influence, both to make people generally less fearful and more disposed to make engagements, and to insure banks against having to suspend. In the steel trade there is regret that the thing was not done three months ago.

Some observers go so far as to express an opinion that the present time will prove to have been the turning point in the general business movement, that recession is now ended and that changes henceforth will be in the direction of betterment.

As to steel itself, these observers think the result might be to make a showing contrary to all precedent, by way of there being increasing steel production in the last two months of the year, when regularly the trend has been downward at that time. There are three lines in which steel production is likely to increase, and if other lines did not decrease the sum total would be an increase, the three lines marked for increases being farm implements, automobiles and rails.

In the last week the farm implement industry has been placing more steel orders but it is not yet actually into its new manufacturing season, making implements for spring distribution and use, while it certainly will be necessary to get going in that direction shortly.

Ford Motor Co. has placed orders for steel to make 50,000 units, about 2,000 daily during November, to supply dealers with samples of the new model. Then there will be quantity production and more steel orders. Some other makers are ordering a little more freely and some new models are to be got into production before the first of the year. The common prediction is that October will be found to have been the low month in automobile production.

As to rails, the Chesapeake & Ohio's orders recently placed for 45,000 tons require some rolling to begin late in November and releases on some old orders are expected. Rail production should be distinctly heavier in December than this month.

Finished steel prices are holding perfectly all along the line. Some manufactured products are weak, large rivets having had two $5 a ton reductions in the last couple months while bolts and nuts are easy.

Steel ingot production in September was officially reported at an amount equal to 28.02 per cent of capacity. Last week production dropped a point or so to about 27 per cent. Some observers think this will prove the minimum, while precedent would indicate further decreases as the end of the year is approached, with a sharp upturn after January 1.

Unfilled obligations of the Steel Corp. decreased 24,624 tons in September against 235,359 tons decrease in August, showing a favorable trend, and a little more than has been usual from August to September.

PROPOSES $30,000,000 PIPE LINE TO PORTLAND

PORTLAND, Ore., Oct. 17.—D. E. Lamb, representing, he said, the International Utilities Corp., announced he has asked the Oregon state highway commission for permission to lay a 20-inch pipe line parallel to the old Oregon trail, to Portland.

Lamb said the company plans to construct this natural gas pipe line from Alberta to Vancouver, British Columbia, at a cost of $30,000,000. The Oregon unit, he said, will cost from $8,000,000 to $10,000,000.

J. M. Devers, attorney for the highway commission, is investigating the matter.

International Utilities Corp. has offices at 150 Broadway, New York, P. M. Chandler, president. It controls Canadian Western Natural Gas Co., Calgary, Alberta, and Northwestern Utilities Co., Edmonton, Alberta.

PIPE MEN LOOK FOR LATERAL LINE BOOM

ATLANTIC CITY, N. J., Oct. 19.—Representatives of pipe manufacturing companies attending the thirteenth annual convention of the American Gas Association here expressed optimistic views regarding the outlook for additional natural gas pipe line construction during the coming year.

While general opinion appears to be that no more major natural gas pipe line projects may be looked for until the present period of economic stress shows a turn for the better, the supply men believe that the coming year will witness a very pronounced boom in the construction of lateral lines, hooking up the present large pipe line systems with many smaller consuming centers, which have been hitherto left out of the picture in the rush to get natural gas to major consuming centers.

There have been a number of inquiries for small sizes of pipe already, indicating that the large natural gas companies which are now co-ordinating the operations of their new lines are about ready to branch out and take in smaller marketing centers in their distribution scheme.

PROGRESS OF GAS LINES IN DANSVILLE-WAYNE

CORNING, N. Y., Oct. 17.—Another month's work on the Iroquois Gas Co.'s line from Dansville to the Wayne Field is expected to see completion of the project. Construction is at the village limits of Hammondsport at the present time. The line will go northward over the hill to the Wayne Field where it will connect with one of two large gathering systems in the field now under construction.

Rich & Co., contractors of Bradford, Pa., have practically completed the construction of gathering lines for all wells owned by the following: Cunningham Natural Gas Corp., Huron Gas Co., Belmont Quadrangle Co. and the Eastern States Natural Gas Co. Gas from these companies' wells will be turned into the Iroquois line.

The other line in the field is being constructed by the Lycoming Natural Gas Co. to connect wells of Tri-State Gas & Electric Co., Bigelow Gas Corp., Lycoming Natural Gas Co., J. B. Reed and others, Decker and others, for sale of gas to the Lycoming company.

BUILDING TANKS

FORT WORTH, Tex., Oct. 19.—The Humble Oil & Refining Co. is constructing five 64,000-bbl. steel tanks at its London tank farm.

LINE TO MILWAUKEE CAN BE LAID QUICKLY

CHICAGO, Oct. 19.—No date has been set for completion of the proposed 170-mile branch pipe line to supply northern Illinois cities and Milwaukee with natural gas, as acquisition of the right of way is still in progress. Once construction is begun it is estimated that the line can be finished in about three months. It will probably be the most important branch line built in connection with the project of making natural gas from the Texas Panhandle available to the Chicago area.

The branch line will use 20-inch and 18-inch pipe as against 24-inch pipe in the main line. While its cost per mile will depend to some extent on the cost of acquiring right of way and the nature of the ground to be traversed, it is not expected to be materially less than for the main line as the only saving of any amount will be in the cost of steel used in the pipe.

The original plan of the sponsors of the Texas-Chicago pipe line project called for the development as rapidly as possible of other available markets for gas than those in and about Chicago, and the contemplated Milwaukee line is in accordance with this plan. Cost of branch lines required to serve these other markets was recently estimated at about $6,000,000 over a 15-year period.

The demands of Milwaukee and northern Illinois alone for gas will not necessitate the construction of an additional main line from the Texas fields. As the Chicago area's market for gas is developed, however, it is estimated that a second main line eventually will be required, and the economics of the situation are such that a larger return on investment is expected at such time from a double line than from a single line.

PANHANDLE EASTERN INTERSTATE OPERATION

JEFFERSON CITY, Mo., Oct. 19.—The Panhandle Eastern Pipe Line Co., in an answer filed with the Public Service Commission to a complaint of the city of Fulton asking that the company be compelled to furnish natural gas to that municipality, asserts that the pipe lines are being operated only for interstate business and that the commission has no jurisdiction over the company. The city contends that the company is engaged in intrastate business and therefore could be compelled to furnish gas to the city, although it has refused to do so.

The commission announced that a hearing will be held.

LINE FOR GREASEWOOD FIELD

CASPER, Wyo., Oct. 17.—The 6-inch oil pipe line from the Teapot pumping station of the Midwest Refining Co. to the Salt Creek Field is being removed. The line was recently purchased from the Midwest company by interests identified with the Aztec Corp. of Denver, which is drilling a test for oil on the Greasewood structure. The line is being taken up by Anderson Trucking Co. and moved by truck to Greasewood and is being strung from there to Orchard, 16 miles south of the new oil field. It is understood the line will be used temporarily to furnish water for the Sultan Drilling Co. which has the contract for drilling the well for the Aztec company. Water will also be sold to other companies for drilling purposes. The line may also, eventually, be used to pipe oil from the field to Orchard instead of water from Orchard to the field. An expenditure of about $75,000 is involved in the purchase, removal and re-laying the line.

NEW GAS FRANCHISE SOUGHT IN KANSAS CITY

JEFFERSON CITY, Mo., Oct. 19.—The Kansas City Industrial Fuel Gas Co. has filed application with the State Public Service Commission for permission to construct and operate a gas distribution system in Kansas City, Jackson and Clay Counties.

The company was granted a franchise by the city February 9, 1931, and now has contracts with responsible producers of natural gas for construction of a pipe line to supply the new company with gas, the application said.

Operation of the Kansas City Industrial Fuel Gas Co. would compete with the Kansas City Gas Co., which is supplied by the Cities Service Gas Co., a Henry L. Doherty subsidiary.

Chairman Milton Stahl of the commission said the application would be set for a hearing soon, after answers had been filed by the Kansas City Gas Co.

Arthur S. Butterworth is president of the new company.

PANHANDLE ILLINOIS MUST FILE COST DATA

CHICAGO, Oct. 17.—The Panhandle Illinois Pipe Line Co. has been ordered by the Illinois Commerce Commission to file data on the cost of the natural gas it plans to supply to numerous central Illinois municipalities.

Counsel for the company asserted it would require months to furnish the detailed figures sought by attorneys for the cities, and moved the approval of new contracts and rate schedules which it was declared would save domestic consumers in Springfield 12 per cent on their present rate for artificial gas and reduce the house heating 38 per cent. The commission reserved decision on this motion.

Counsel for the city of Springfield and 30 other municipalities declared that "greatly reduced rates are the only excuse for a change from artificial to natural gas service," and opposed any use of natural gas until complete information as to cost has been submitted and studied.

CHICAGO NOW USING NEW BLENDED GAS

CHICAGO, Oct. 19.—Peoples Gas Light & Coke Co. is now supplying practically all its customers with new mixed or blended gas of higher heating value made possible by the construction of the pipe line from the Texas natural gas fields. Turning of natural gas into Chicago mains after blending with manufactured gas was delayed by Illinois Commerce Commission hearings on new gas rates. The switchover was carried out with exceptional smoothness.

NEW P. G. & E. UNIT

LOS ANGELES, Calif., Oct. 17.—The Pacific Gas & Electric Co. is at work on a unit in the new line between San Francisco and Milpitas, a station on the Kettleman Hills main pipe line, in Santa Clara County on the Alameda line, where the company's line into San Francisco and the line to Oakland and the east side of the bay branch.

The unit now started will be 7 miles long, and extends from the company's Potrero plant in San Francisco to the San Mateo county line. It will be 20 inches in diameter. The line from Milpitas to San Francisco is expected to be built in the fall or soon after January 1, 1932, in accordance with a recent announcement by Paul Downing, vice president and general manager. The distance will total about 45 miles.

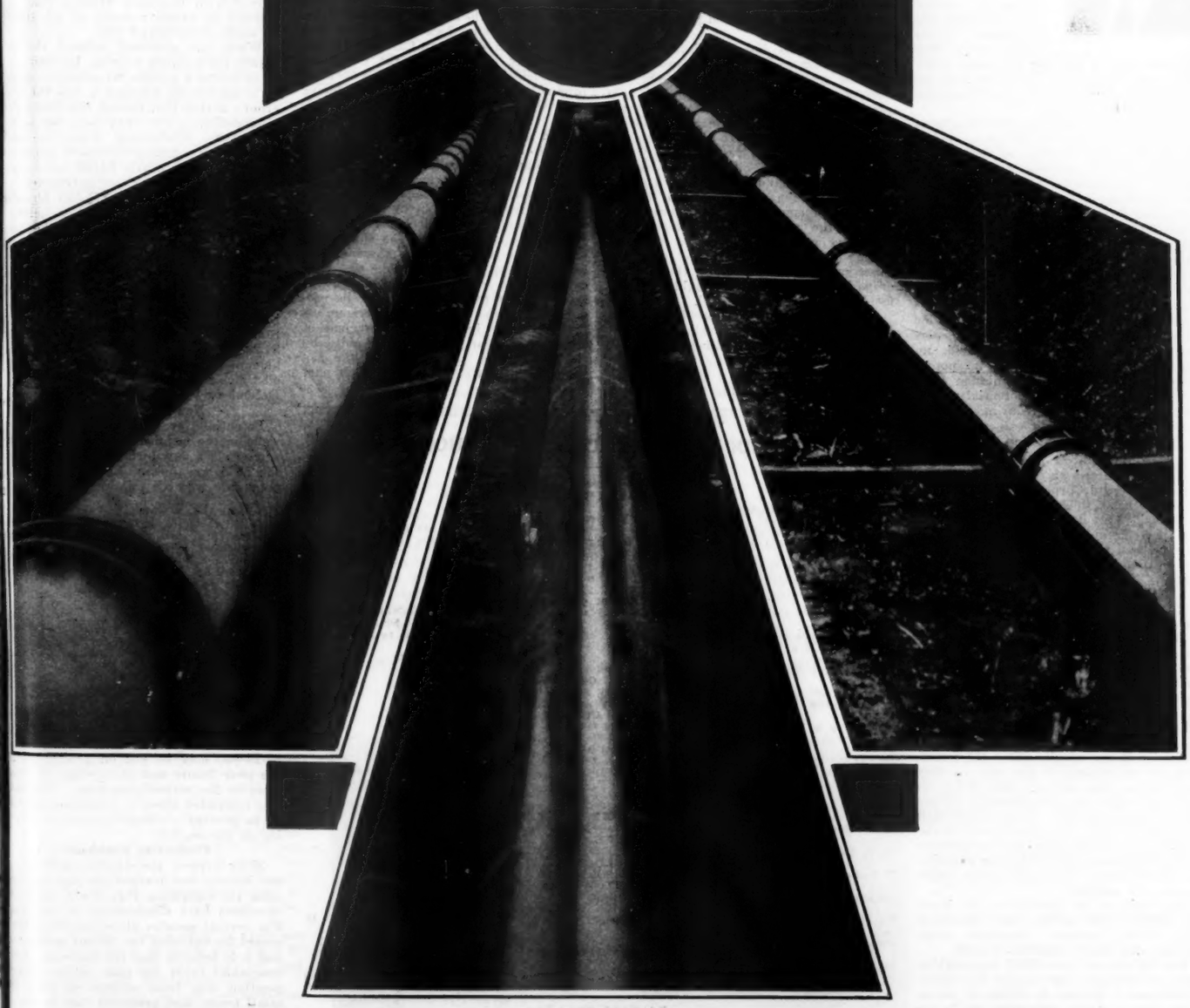
IT ALL LEADS TO THIS

BITUMASTIC

REG. U. S. PAT. OFF.

ENAMEL

—has been used on *most* of the big oil and gas lines—invariably upon those sections where corrosion is adjudged most severe —because no other coating has proved so effective, under so wide a diversity of conditions, over so long a period of years.



WAILES DOVE-HERMISTON CORPORATION

17 Battery Place, New York

Philtower Bldg., Tulsa

Philadelphia	Cleveland	Chicago	San Francisco	Los Angeles
401 N. Broad St.	Union Trust Bldg.	20 N. Wacker Drive	345 Vermont St.	2461 E. 8th St.

Oklahoma Production Below Allowable

Shutdown Fields Reopened in Past Week Not Permitted to Produce Up to Market Requirements. Future Plans

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

The opening of the prorated fields in Oklahoma after a two months shutdown resulted in an increase of approximately 253,900 bbls. of crude oil a day during the week ending October 17, when the State averaged 505,000 bbls. of oil a day, compared to 251,135 bbls. the previous week. The lifting of martial law permitted the Oklahoma City Field to average 165,600 bbls. a day for the same seven days, and the Greater Seminole area increased its production to a daily average of 120,000 bbls. a day.

The daily allowable of the Oklahoma City Field of 6 per cent of the potential during the last 12 days of the month, effective October 20, was announced by Lieut. Col. Cicero I. Murray, in charge of the military proration in the State. In announcing the increase in the allowable the military order which expires October 20 was extended to November 1. The daily allowable had been 5 per cent of the potential, for 10 days.

Percentage allowables for all wells in the Oklahoma City Field were being figured and will be announced in a few days. No changes were made in the rules and regulations covering the field, no completions are allowed and no potentials permitted without permission from the commanding officer. Potential gauges on wells were permitted during the past week.

Corporation Commission Hearing

All of the State's prorated oil areas will be considered at the public hearing before the State Corporation Commission on October 26, to determine the new allowables. The date was originally set for a hearing on the Oklahoma City Field on a petition presented by the Indian Territory Illuminating Oil Co. for the operators.

After the meeting held in Tulsa by the state fact finding committee it voted to recommend an allowable of 545,000 bbls. a day for the State for the last two months of the year. The amount is 1,000 bbls. a day less than the Oil States Advisory Committee recommended for the State. The fact finding committee voted to ask the Corporation Commission to take a 10-day proration gauge of the Greater Seminole Field as soon as possible and if the results show the potentials are approximately the same as they were before the military shut down, to hold the output to approximately 50 per cent of the potentials. Every effort will be made to hold the production to the committee's recommendation, to allocate to the Oklahoma City Field any additional demand that may arise from Oklahoma's oil markets.

The areas to be affected at the hearing October 26, include the Oklahoma City Field, Greater Seminole area, Tatums and West Chandler Fields.

The Oklahoma City Field is operating under a 10-day order issued by Lieut. Col. Cicero I. Murray in charge of proration. It fixed the maximum at 5 per cent of the potential, while the commission's present order which expires November 1, has the allowable at 6 per cent. Colonel Murray stated he would issue an extension military order to continue in force from October 20 to November 1, at which time the Oklahoma Corporation Commission's order, if issued, will be effective.

Under the present military order the prorated fields in the State are allowed to produce as follows: Greater Seminole area, 144,566 bbls. a day; Tatums field in Carter County, 5,642 bbls. a day; West Chandler in Lincoln County, 1,396 bbls. a day, and the Oklahoma City Field approximately 175,000 bbls. a day. Under these allowables, with the stripper areas left untouched, the State's estimated daily production will be 525,000 bbls.

Gas-Oil Ratios

During the week Lieut. Col. Cicero I. Murray, in charge of proration in the State, plans to fix a gas-oil ratio for the Oklahoma City Field to install chokes on all producing wells, and put stop locks on all wells.

It is believed the installation of all these measures will serve to conserve the oil and gas resources in the field and prevent waste of gas energy and help prevent the illegal production of crude oil. In applying the gas-oil ratio Colonel Murray will have the co-operation of all the operators. The field is being produced on a low gas-oil ratio, as most of the operators found early in the development that the gas flowing into the air was wasted energy. It is believed that some of the wells in the Oklahoma City Field are operating on as low as 450 feet of gas per barrel of oil. At a recent court suit engineers testified that an average ratio for the field would be 2,000 feet of gas per barrel of oil.

Colonel Murray believes that chokes on wells would aid in working out the gas-oil ratio, and it is also believed chokes would help in keeping the field within the allowable limit.

Locks on gates on the flow lines between the casinghead connections and storage tanks might prevent the illegal production of crude oil, Murray thinks. The keys to the locks would be in the hands of the officers in charge of proration and permission to produce the well would be granted by the officers.

When a battery of tanks was filled with crude oil, the well would be shut in and the gates locked, under the Murray plan. The officials in charge of proration would have a record of the amount of oil produced. Pipe lines could move the crude oil from the tanks at any time, but the storage tanks could not be filled again until the locks were unlocked. Murray said the stop lock system has been found to be a success in California fields.

Company engineers in the Oklahoma City Field are working out a system of production methods on wells producing from the Johnson sand and the Arbuckle lime. When wells in these zones were opened during the last week many were found to be flooded with water and others were nonflowing or "dead." Still others showed considerable cavings and will be cleaned out later. "Dead" wells are being agitated in attempts to revive them, while many will be put on the gas lift. It is not known whether the shut down caused the wells to quit flowing, but little was expected of the lime wells because of the water encroachment which started about two years ago. Wells producing from the Wilcox sand horizon, especially those in the northwest end of the field, appear to have been aided by the shut down. It is believed the gas energy has been equalized over that part of the field.

During the week Governor Murray stated that he was opposed to a public investigation of charges there had been excess runs in the Oklahoma City Field during the martial law shutdown.

Governor Murray threatened grand jury action if the statements were not stopped. He advised the royalty owners to take the evidence of alleged corruption in oil runs from the Oklahoma City Field, under proration and military shutdown, to the grand jury.

Paul Walker, chairman of the Oklahoma Corporation Commission, also agreed with Governor Murray that the charges of illegal running of oil should be made to the grand jury.

While the governor refused the demands for a public hearing, he intimated he is having a private investigation made. It is not known whether it was the governor's action that caused the State Tax Commission to cite Oils, Inc., before the commission Wednesday, when the officials of the company confessed judgment to the State for nearly $4,000 for unpaid gross production tax on unreported oil runs of approximately 175,510 bbls. of oil from its No. 1 Ross. It is believed the tax commission is handling the matter solely from the question of unpaid gross production tax, and not in view of securing evidence of illegal taking of oil while the field was under martial law.

Hall & Briscoe, operating in the Oklahoma City Field, also agreed to pay the State Tax Commission approximately $4,233 gross production tax, representing amount of state tax on unreported crude oil which the company shipped out during December, 1930, and January, 1931.

New-well Potentials

Potentials are being taken on new wells in the Oklahoma City Field at the rate of six a day during the first 10 days the field was open. Recent gauges for potentials were as follows:

Company and wells—	Bbls.
Slick Oil Co.'s No. 1 Terminal	30,784
Donleon Oil Co.'s No. 1 Burt	39,900
Watchorn Oil & Gas Co.'s No. 1 Compress	46,023
Wilcox Oil & Gas Co.'s No. 1 Hudspeth	49,108
Slick Oil Co.'s No. 2 Central	24,004
Slick Oil Co.'s No. 4 Classen-Edwards	30,691
Slick Oil Co.'s No. 1 Egbert	42,964
Slick Oil Co.'s No. 3 Frisco	26,282
Phillips Pet. Co.'s No. 1 Perry	20,761
Phillips Pet. Co.'s No. 1 Sams	44,672
I. T. I. O.'s No. 1 Billen	1,634
Morgan Oil Co.'s No. 1 Gibbons	32,665
Coline Oil Co.'s No. 16 Clauer	1,060
Westgate Oil Co.'s No. 1 Carey	38,109

Some express the opinion that the Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 1 Messer, in Section 32-14-3w, may be put on production in the near future and start other development in the surrounding area. The well was completed about a year ago and shut in to prevent a flood of crude oil coming on the market.

Production Problems

Many express the opinion that Governor Murray has dropped his plan of unitizing the Oklahoma City Field since the operators have disapproved of the plan. For several months plans have been discussed for unitizing the Wilcox sand area, and it is believed that the large major oil companies favor the plan, while the opposition was from owners of wells on small tracts who protested that it was a plan to reduce their monthly allowable flow.

There is now pending before the Oklahoma Corporation Commission a petition filed by Wirt Franklin, asking for a zoning of the different pay horizons, with different allowables for each zone. This is one of the plans that has been considered along with the unitization plan. The Indian Territory Illuminating Oil Co. also has a petition before the commission

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location— Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW, Sec. 12-27-11w ..... Shut down 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE, Sec. 14-24-11w ... Shut down 5,502 ft.

ATOKA COUNTY

Campbell's No. 1 Baird, NW NE SW, Sec. 31-1-13 ..... Rig.
Edgerton Edwards' No. 2 Rowland, SE NE NW, Sec. 6-1-15 ..... Rig.

BECKHAM COUNTY

Price-McFann's No. 1 Webster, C SW SW, Sec. 34-8-26w .. T. D. 2,244 ft.; plugged back to 1,890-1,900 ft.; 1,500,000 ft. gas.
Mid-Continent's No. 1 Schaff, C NE SW, Sec. 22-11-22w .. Waiting on cement to set 430 ft.
Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW, Sec. 17-3-22w ..... Shut down 2,550 ft.
White et al's No. 1 Green, SW cor., Sec. 24-10-24w ..... Shut down 3,575 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW, Sec. 13-19-10w ..... Shut down 5,115 ft.

CADDO COUNTY

Abernathy & Brown's No. 2 Houston, Sec. 24-6-13w ..... Shut down 1,115 ft.
La Piere et al's No. 1 Woods, C SE SE Sec. 27-17-21 ..... Drlg. 1,047 ft.

COAL COUNTY

Radial Oil Co.'s No. 1 McCraw, NE NW, Sec. 2-1s-8 ..... Drlg. 830 ft.
McCraw Oil Co.'s No. 1 Ward, NE SE, Sec. 35-1-8 ..... Drlg. plug; showing 2,000,000 ft. gas 1,765-1,846 ft.; mudded off gas; shut down.
Whitney et al's No. 1 Miller, SE NE, Sec. 10-2-8 ..... Shut down 760 ft.

COMANCHE COUNTY

G. W. Stogner's No. 1 Doebel, C SW SW, Sec. 3-3-9w .... Shut down 1,450 ft.

LE FLORE COUNTY

H. E. Dowd et al's No. 1 Unknown, SE NE, Sec. 17-3-32 .. Fishing 1,112 ft.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW, Sec. 9-24-6w .. Shut down 5,850 ft.

GARVIN COUNTY

Malarnee et al's No. 1 Phillips, NE SW SE, Sec. 24-2-2w .. Shut down 4,830 ft.

GREER COUNTY

Dovell et al's No. 1 Capell, NW cor., Sec. 1-7-22w ..... 5,000,000 ft. gas 1,455-65 ft.; T. D. 1,760 ft.
French's No. 1 Murphy, SW NW, Sec. 23-7-21w ..... Shut down 1,645 ft.

HARPER COUNTY

Sinclair Oil & Gas Co.'s No. 1 Howell, C SW SW, Sec. 14-26-24w ..... 20,000,000 ft. gas 5,350-5,498 ft.; T. D. 5,539 ft.; shut down; sprayed 50 bbls. gasoline.

HASKELL COUNTY

Ault et al's No. 1 Harrison, CWL SE NE, Sec. 14-9-19 ... Shut down 650 ft.
Ault et al's No. 1 Hall, NW SW SW, Sec. 14-9-19 ..... Shut down 2,000 ft.
Ault et al's No. 1 Hall, SE NW, Sec. 25-9-19 ..... Shut down 300 ft.
Holden's No. 1 Phillips, SE cor., Sec. 3-9-18e ..... Shut down 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW, Sec. 16-9-18e ... Shut down 3,247 ft.

HUGHES COUNTY

Wright et al's No. 1 Ott, SE SW, Sec. 15-5-11 ..... 1,600-34 ft; wtr.; T.D. 1,650 ft.; abd.

KAY COUNTY

Lewis et al's No. 1 Harris, SE NW, Sec. 14-25-1 ..... Location.
Mummert Drlg. Co. et al's No. 1 Cormick, C NW SE, Sec. 9-27-3 ..... Shut down 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w ..... Rig on ground.

(Continued on Page 70)

to allow companies with production in the Arbuckle lime area to drain the lime horizon so the wells may be exhausted of their oil and then plugged back to the shallower gas sands, which were mudded off while the well was being drilled.

It is believed that these problems will again be presented to the Corporation Commission when the hearing on the state-wide proration for the last two months of the year is held in Oklahoma City on October 26.

Fire Extinguished

The Empire Oil & Refining Co.'s No. 2 Gustin, NW cor. SW NE Section 1-11-3w, was extinguished during the week after a shot of nitroglycerin after it burned for four days. It was the tenth fire in the Oklahoma City Field and the first in which there was a casualty. The other serious fires in the field were the Sinclair Oil & Gas Co.'s No. 3 Stamper, which ignited October 8, 1929, and burned three days before being shot out; Sinclair Oil & Gas Co. and Amerada Petroleum Corp.'s No. 5 Kinter, which caught fire March 1, 1930, and burned 13 days before being shot out; same companies' No. 1 Kinter, on December 19, 1929, which damaged the boiler house; same companies' No. 1 Kinter, on March 20, 1930, which destroyed the boiler house and rig floor; Tom Slick Oil Co.'s No. 6 Hoops, on April 30, 1930, when 100,000,000-foot gas production caught fire but was extinguished in 15 minutes by shutting the master gates; Plains Petroleum Co.'s No. 1 Sadler, which caught fire January 5, 1931, when oil in the cellar burned; Cromwell-Franklin Oil Co.'s No. 3 Trosper Park, on February 10, 1931, while bailing, but which was shut in with little damage; and the British-American Oil Co.'s tanks on the Holmes lease, which caught fire in the early part of 1931.

Lease Shorteners Continue

Wildcat acreage is still being released by oil companies to a greater degree than new acreage is being taken, and rentals are being reduced on all other acreage which has considerable time yet to go before it expires. The only purchases of new acreage in the State at this time are after geological surveys have been made. The oil companies are turning to the use of the seismograph and other geophysical machines to determine the location of future oil deposits and are purchasing acreage in favorable localities when found. The large blocks of acreage which were assembled several years ago are being reduced as considerable acreage on the edge of these blocks and checkerboard acreage is being released.

In Caddo County, J. A. Hull Co. has released the NW Section 34-11-11w, the SW Section 17-11-11w, and the S half SE, Section 12-6-9w. Denver Producing & Refining Co. has surrendered a lease on the N half NE, Section 34-9-12w, and the S half NW, Section 33-8-11w, the NE Section 27-11-13w, and the N half SW, Section 8-9-12w. Darby Petroleum Corp. has surrendered on E half NE, Section 12-7-11w, the SW Section 20-7-9w, the SW Section 23-10-10w, and the E half NE, Section 35-10-12w.

In Garvin County, the Texas Pacific Coal & Oil Co. has surrendered leases on the NW Section 12-3-4w, the SW SE, Section 9-4-2w, N half NE, Section 16-4-2w, and seven small tracts in the SE and SW Section 11-4-2w. Magnolia Petroleum Co. has released the NW Section 23-4-2, S half NW, Section 35-4-2. The Mid-Kansas Oil & Gas Co. has released approximately 50 tracts scattered in Townships 2-3w, 3-2w, 4-2w, 4-1w, 4-3w, 4-1 and 3-3w.

In Jefferson County, Roy M. Johnson surrendered leases on the E half NE NW and W half NW NE and S half SW and W half SW SE, Section 35-5s-6w.

In Coal County in the southeastern part of the State, Mid-Kansas Oil & Gas Co. has surrendered leases on tracts in Townships 1-10, 2-11, 2-10 and 2-9.

In Dewey County, the Indian Territory Illuminating Oil Co. has surrendered leases on the SE Section 21-19-17w, SW Section 13-19-18w, NE NE and the S half NE, Section 24-19-18w, NE Section 12-19-18w, S half NE, N half SE and NW NE, Section 13-19-18w, the E half NE and E half SE, Section 7-19-17w, and NE Section 18-19-17w.

In Alfalfa County, the Mid-Kansas Oil & Gas Co. has surrendered school land leases on the NE and SW Section 16-24-10w, and SE Section 36-25-11w.

New Leases Purchased

During the week many believed that the leasing of prospective oil and gas acreage would increase and it has in scattered areas in the State. The area surrounding the wildcat test of the Mid-Continent Petroleum Corp. in Section 2-6-4, Pottawatomie County, the Amerada Petroleum Corp. and Mid-Continent Petroleum Corp. were heavy purchasers of leases and royalty. It is reported that the Mid-Continent Petroleum Corp. paid as high as $100 an acre for leases in the same section in which the well is located and in the adjoining section. The Amerada Petroleum Corp. is believed to have purchased all the available acreage around the well and to have also purchased royalty under the well. It is reported the Amerada Petroleum Corp. has made an extensive geophysical survey in the vicinity of the test.

Interest on the east side of Oklahoma County was revived during the week. The Amerada Petroleum Corp. assigned to Hargrove Hudson 20 scattered leases centering around the townsite of Jones and as far south as Choctaw. There is some trading in leases on the west side of the Oklahoma City Field. In Lincoln County around the Hilton Phillips wildcat test leasing has been active. Scattered acreage in Creek County has been leased.

The tracts included in the Amerada Petroleum Corp. and Hargrove Hudson transaction were as follows: The SW, Section 7-12-1w; E half SE, Section 23-12-1w; N half NW, Section 26-12-1w, E half SW, Section 15-12-1w; SW NW and SE NW, Section 31-12-1w; NW, Section 6-13-1w; SE, Section 15-13-1w; N half NW and SE NW, Section 16-13-1w; SW, Section 27-13-1w; W half NE, Section 27-13-1w; E half SW, Section 28-13-1w; N half NE, Section 33-13-1w; SW, Section 35-13-1w; NE, Section 15-13-1; SW, Section 12-13-1; SW, Section 13-13-1; SE, Section 8-14-1; S half SW, Section 10-14-1; SW, Section 24-14-1; SE, Section 30-14-1; E half NW, Section 7-14-1; N half NW, Section 22-12-1; N half SW, Section 18-11-1w; SW, Section 14-14-1w; SW, Section 28-14-1w.

On the west side of the Oklahoma City Field W. W. Milam has assigned to H. F. Potts part of NE and part of NW, Section 10-11-3w, and part of NE, Section 9-11-3w.

In Pottawatomie County, the Gypsy Oil Co. has leased the W half NW, Section 28-9-3, and NW, Section 4-8-5. J. A. Hull Co. has assigned a half interest to Amerada Petroleum Corp. in the S half SW, Section 4-9-5, and the NW NW, Section 20-8-5. Darby Petroleum Corp. assigned a one-third interest to the Tidal Oil Co. in the S half SE, Section 32-9-3 and SW, Section 4-10-5.

In Lincoln County, the Prairie Oil & Gas Co. leased the NE Section 9-13-3, the SW Section 27-14-3, W half NW Section 14-12-5, the S half SE and the SW SE Section 22-15-5. The Mid-Continent Petroleum Corp. leased the E half SE Section 33-19-3, and the E half NE Section 7-15-5.

Seminole Production

The production from the Greater Seminole area for the week ending October 16, was approximately 136,070 bbls. The first 12 pools listed below comprise the Seminole area which averaged 104,345 bbls.

Pool—	Bbls.
Little River	19,515
East Little River	3,915
Carr City	11,205
Maud	1,775
Mission	6,740
Bowlegs	12,080
Earlsboro	14,930
South Earlsboro	4,325
East Earlsboro	14,125
Seminole	10,615
East Seminole	1,375
Searight	3,745
Total	104,345
Allen	6,705
Asher	810
Wanette	1,815
Konawa	1,715
Sasakwa	2,710
St. Louis-Pearson	17,970
Total	136,070

The daily production and the pipe line shipments from the Oklahoma City Field for the week ending October 17, were as follows:

Date—	Prod.	Wells	Shipments
October 11	368,068	130	81,261
October 12	135,674	98	130,800
October 13	152,206	112	123,000
October 14	155,051	113	157,396
October 15	167,154	106	133,564
October 16	91,106	99	127,160
October 17	98,093	96	132,150

Withdrawals From Storage

Withdrawals from storage in the Greater Seminole area during the week ending October 14 declined compared to the previous week. The amount was approximately 11,000 bbls. a day compared to 22,000 bbls. the previous week. The Indian Territory Illuminating Oil Co. withdrew an average of 3,200 bbls. a day from its storage in Section 22-8-6, shipped to the Globe Refining Co. at Lamont, Ill. Stanolind Crude Oil Purchasing Co. withdrew approximately 2,700 bbls. a day from tanks in Section 3-9-4. Pure Oil Co. withdrew 4,000 bbls. a day from storage at 28-9-6. White Oak Refining Co. withdrew 500 bbls. daily from 7-9-6. The Texas Company withdrew 1,600 bbls. a day from 35-8-6.

Magnolia Petroleum Co. put 1,150 bbls. daily into storage at Maud. The Texas Company put 250 bbls. of crude a day into storage at 34-9-6. The Empire Oil & Refining Co. ran 350 bbls. daily to storage tanks in 14-8-6.

Creek County

R. E. Freeman and others' No. 1 Young, SW cor. NE NW, Section 15-19-7, is a machine rigging up. C. O. Buckles' No. 1 Flinchum, NE cor. SE SW, Section 11-19-9, is drilling at 200 feet. Holmes Drilling Co.'s No. 3 Burnett, NW cor. SE NW, Section 7-19-10, is a machine rigging up. Byran Petroleum Co.'s No. 3 Ta-Co-Nay, NE cor. NW SW, Section 3-17-10, is a machine rigging up. O. C. Baltzell and others' No. 1 Land, SW cor. NW, Section 12-18-11, has been completed for 20 bbls. in sand 1,424-46 feet, total depth 1,456 feet.

Lincoln County

Magnolia Petroleum Co.'s No. 1 Cash, SW cor. NE SW, Section 6-14-14, Chandler area, is dry and abandoned in Wilcox sand at 5,130 feet.

Marshall County

Charles Everett and others' No. 1 Ayers, SW cor. NE NE, Section 14-2s-6, is fishing at 325 feet. M. A. Neff's No. 1 Rice, SE cor., Section 10-5s-5, has been abandoned at 862 feet.

Muskogee County

R. B. Hash and others' No. 1 L. Grayson, NW cor. SE, Section 35-16-15, has been completed for 750,000 feet of gas in sand 1,072-90 feet.

Oklahoma County

T. B. Slick estate made location for No. 7 Classen-Edwards, SE cor. SW SW, Section 3-11-3w, Oklahoma City Pool. Phillips Petroleum Co. has the cellar dug for No. 1 Gallman, CNL NE NW NE, Section 3-11-3w. No. 1 Burnett, NE cor. SW NW SE, Section 15-11-3w, is a location. Phillips Petroleum Co. and Sultan Petroleum Co. made location for No. 1 Classen, Block 87, Shields South Oklahoma City Addition, SW cor. SE SE NW, Section 15-11-3w.

Okmulgee County

Mack Drilling Co.'s No. 1-A L. Anderson, SW cor. NE NE, Section 36-16-14, has been completed for 30 bbls. in sand 1,360-80 feet.

Pawnee County

M. P. Tippin and others' No. 1 Tippin, NE cor. SW SW, Section 24-22-6, is spudding. Ed Reese's No. 1 Rules, CWL NW SE, Section 9-20-7, is a machine rigging up. Peter Adamson, Jr.'s No. 1 Ice, SW cor. NE, Section 4-20-8, is drilling at 1,230 feet. M. R. Jensen's No. 3 Tate, NE cor. NW, Section 9-20-9, is dry and abandoned at 1,340 feet. T. E. Harris and others' No. 1 Twedy, SE cor. NE NW, Section 14-20-9, has been completed for 250,000 feet of gas in sand 953-72 feet.

Pittsburg County

W. B. Haley and others' No. 1 Johnson, NW cor. SW, Section 9-5-14, is rigging up.

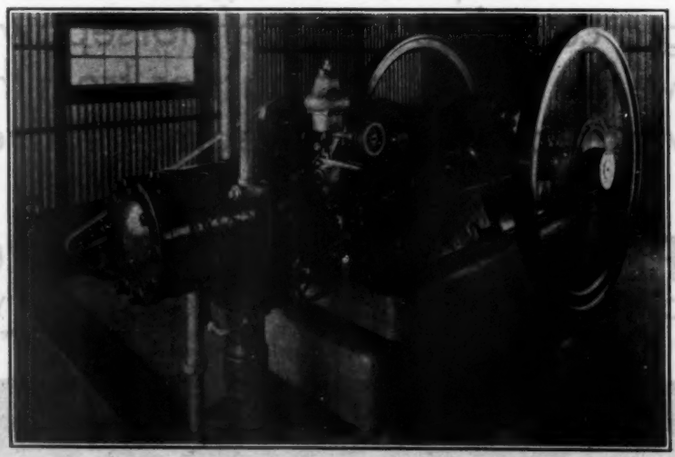
Pottawatomie County

Mid-Continent Petroleum Corp. made location for No. 1 Farmer, SW cor. NW, Section 2-6-4.

Wagoner County

Sheridan Oil Co.'s No. 1 C. Snake, SE cor. NW, Section 26-18-15, is drilling at 300 feet. Boley and others' No. 1-A E. Haney, SW cor. NE NE, Section 13-17-15, is dry and abandoned at 1,007 feet. A. W. Swift's No. 1 A. Adams, SE cor. SW SE NE, Section 7-16-17, has been abandoned at 1,700 feet.

PUMPING ENGINE IN EAST TEXAS AREA



The Continental gas engine built by Fairbanks, Morse & Co. that is convertible from gas to oil for fuel at small expense. These engines are popular in the East Texas and other oil fields for pumping operations.

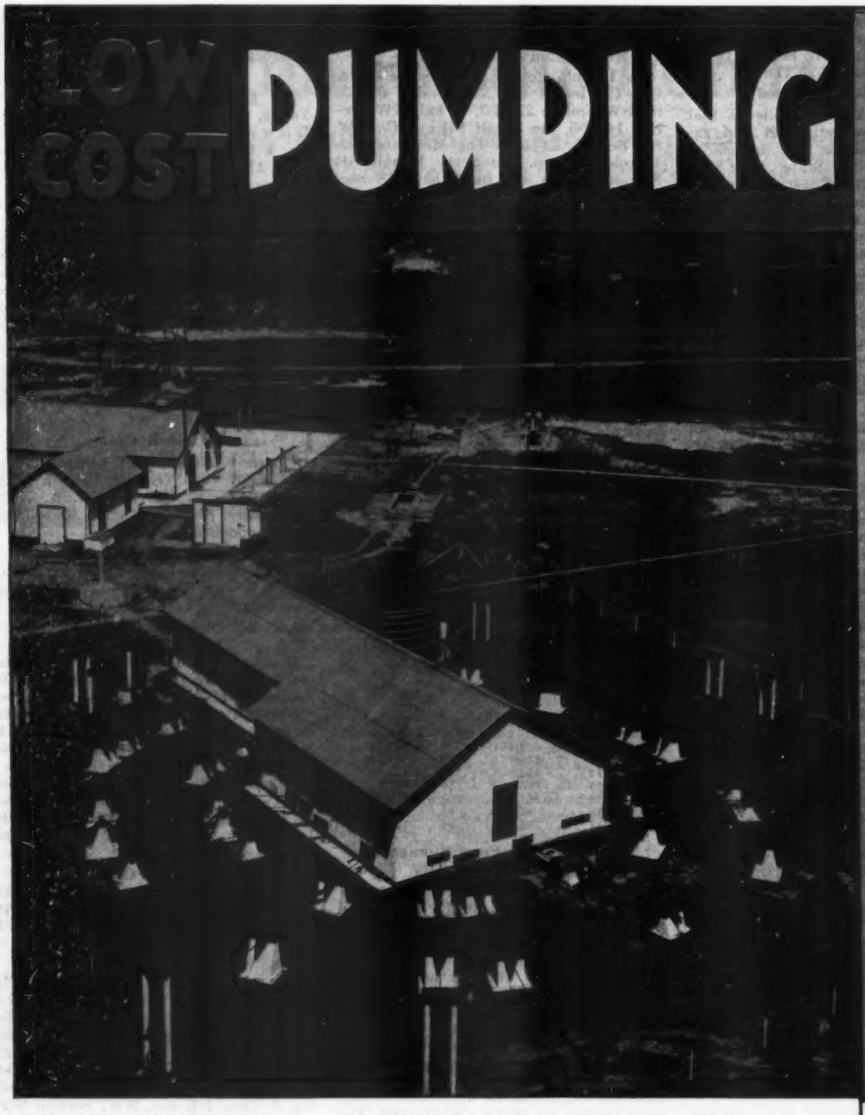
P. H. WILLIAMS DIES

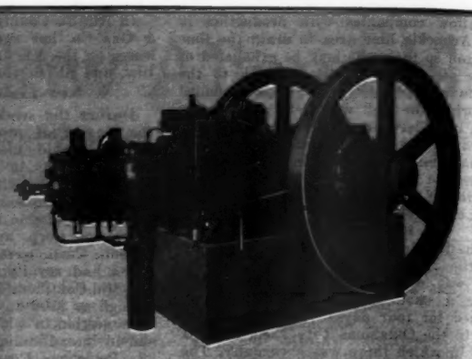
SAN ANGELO, Tex., Oct. 19.—Peter Harding Williams, 57, who staked part of a fortune made in Crockett County oil in 1927 in drilling unassisted and successfully the world's deepest test with cable tools in Irion County, succumbed here this week to a long illness.

A. J. SAYERS, ENGINEER, DIES

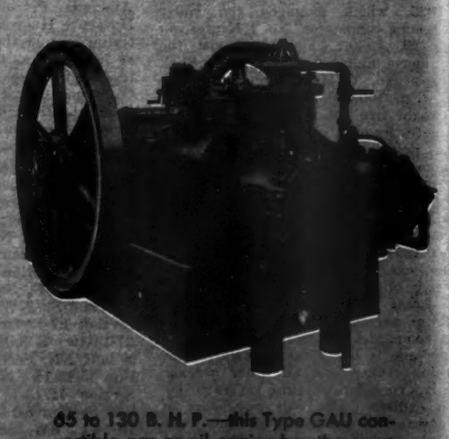
Albert Jefferson Sayers, 61, engineer for the Link-Belt Co., Chicago, died in his home, 7121 Eggleston Avenue, Chicago, Sunday, October 11. Mr. Sayers was head of the coal tipple and coal washery department of the Link-Belt Co.

LOW COST PUMPING





25 to 60 B. H. P.—this Type GA convertible oil or gas engine is an improved model of the engine on Sak-Long lease. (Photo shows oil engine.)



65 to 130 B. H. P.—this Type GAU convertible gas or oil engine has the same improvements as Type GA. 2-cycle simplicity with 4-cycle economy. Gas injection pumps optional. (Photo shows gas engine.)

Upper Left—THREE YEARS AT LOW COST—a 50 horsepower Type OF Cooper-Bessemer gas engine has been pumping sixteen wells, at a depth of nearly 2700 feet, for The Prairie Oil & Gas Co. on Sak-Long lease near Oilton, Oklahoma.

PUMPING gives fast, low-cost production: Oil production authorities agree that it is the profit-making method for shallow, medium and deep fields. Improved Cooper-Bessemer engines, offering a complete range of horsepower with drastic economy, remove the power cost barrier from the pumping of your wells. Why not talk with our representative? There is no obligation.

THE COOPER-BESSEMER CORPORATION

MOUNT VERNON, OHIO
201 E. First Street, Tulsa, Oklahoma
1313 Magnolia Building, Dallas, Texas

GROVE CITY, PENNSYLVANIA
640 E. 61st Street, Los Angeles, California
Suite No. 301, 25 W. 43rd Street, New York, N. Y.

Ritz-Canton Pool Is Extended One Mile

Field is Now 7 Miles Long. Production in Kansas Declines 5,800 Bbls. Cheyenne Bottoms Attracts Operators

By W. A. Spinney
Staff Correspondent, Kansas Fields

Crude oil production from Kansas fields showed a substantial reduction for the week ending October 17, amounting to 5,800 bbls. a day, compared to the previous week. The daily average was approximately 101,600 bbls., against 107,400 bbls. in the week before. The largest decline was in the Ritz-Canton Pool, in McPherson County, which showed a loss of approximately 5,000 bbls. per day.

Production in the Ritz-Canton Pool was extended 1 mile south by a Viola lime well. The well adds considerable territory to be developed in the future. Schaffer Oil Co. of Wichita and others' No. 1 McGill, SW cor. NE, Section 7-20-1w, in the south end of the field, found a showing of oil that rose 2,500 feet in the hole in a short time, from the Viola lime at 3,406 feet. The well extends Viola lime production in the Ritz-Canton to a length of 7 miles. The three offset leases to the new well are owned by the Gypsy Oil Co., Phillips Petroleum Co. and Washoma Oil Co.

New Sand in Ritz-Canton

A new sand was found in the Ritz-Canton Field during the week when Smith & Ash's No. 2 Kaegi, NE cor. NW, Section 21-19-1w, found what was rated to be a 25-bbl. showing of oil in a sand at 1,757-85 feet. The test is located on the northeast edge of the field and was being drilled in search of gas production in the chat. The lease was farmed out to Smith & Ash by the Shell Petroleum Corp. Water was found in the bottom of the sand. The 12-inch casing will be underreamed and landed at approximately 1,800 feet, the present total depth.

Wells in the Ritz-Canton Pool have increased their potential production by deeper drilling and by shooting. Lario Oil & Gas Co.'s No. 1 in the SE cor. NW, Section 24-19-1w, was drilled deeper to the Viola lime at 3,390-96 feet and made 1,483 bbls. of oil the first 24 hours after a 20-quart shot. Dieter and others' No. 2 in the NW cor. SW, Section 19-19-1w, was given a shot of 30 quarts and increased its production to 1,216 bbls. the first 24 hours from the Viola lime at 3,396-3,417 feet.

A Dangerous Condition

Oil wells in the Ritz-Canton Pool, in McPherson County, were shut down for several days while a blanket of natural gas hovered low over the field, due to atmospheric conditions. All drilling wells were shut down and field men took every precaution to prevent explosions. The absence of wind and the moisture-laden atmosphere were credited with causing escaping gas to settle close to earth. Some of the drilling tests shut down were the Abilene Oil Co.'s two which were showing gas while drilling into the pay horizon. The Lario Oil & Gas Co.'s No. 1 Lewis, NW cor., Section 36-19-2w, found the top of the chat at 3,074 feet, and it was shut down. The Wolf Creek Oil Co.'s No. 1 McMurray, NE cor., Section 6-20-2w, found what was estimated to be 3,000,000 feet of gas in the chat and it was being drilled deeper to the Viola lime.

At the time of the shut down, J. H. Reid and others' No. 1 Keefer, on Lot 16, Block 2, Canton Townsite, in Section 21-19-1w, was drilling at 1,400 feet. The area surrounding the townsite has been yielding some large gas wells and several of the drilling tests expect to reach the pay horizons in a few days. Shawver and others' No. 1 Lively, SW cor. NW, Section 21-19-1w, was drilling at 2,500 feet. Same company's No. 2 Kaegi, NE cor. NW NW, Section 21-19-1w, was drilling at 2,000 feet. It offsets a 31,000,000-foot gas well recently completed by Shawver.

Potential Gauges

Potential gauges were being taken on wells in the Schurr Pool, in Rice County, and it was indicated that the field would gauge approximately 8,500 bbls. a day, when 8 of the 11 completed wells had been tested and checked by Field Umpire L. R. Pickrell. The average production of the 8 wells in the Schurr Pool, that completed their first 24-hour potential tests was 768 bbls. each. The wells completing their first gauges were Vickers Petroleum Co.'s No. 1 Binger, 915 bbls.; same company's No. 2 Binger, 347 bbls.; Slick, Pryor & Lockhart's No. 1 Schurr, 742 bbls.; Producers & Refiners Corp.'s No. 1 Thompson, 428 bbls.; Phillips Petroleum Co.'s No. 1 Metzger, 1,202 bbls.; same company's No. 2 Metzger, 978 bbls.; Allison, Fitzwilliam and others' No. 1 Metzger, 886 bbls.; The Texas Company's No. 1 Thompson, 650 bbls. The remaining three wells were being gauged over the week-end. All the operators agreed to the rule that they would use 2½-inch tubing, 2½-inch working barrel and a stroke not to exceed 54 inches.

The field was opened on October 1, after being shut in for nearly a year, under an agreement that each well be allowed to produce 100 bbls. a day until November 1, when the daily allowable will be increased to 15 per cent of the potential gauges. The present allowable production of the pool is 1,100 bbls. a day and under the new allowables of November 1, when 15 per cent of the potential is allowed it will only amount to a small increase. If the potential of the pool is fixed at 8,500 bbls. a day, 15 per cent allowable would be 1,275 bbls. a day. The old estimated potential was 15,000 bbls. a day, which was proved to have been a bad guess.

Studying Cheyenne Bottoms

During the last few months considerable interest has been centered in the Cheyenne bottoms of Barton County. Geophysical machines have been moved into the bed of the lake since the water has vanished and since the ground has become dry enough for cars to drive over it. The lake bed has been leased by several oil companies and these companies are taking advantage of their first opportunity to test the area by making a survey of the geological conditions. Previous to this time the water covered an area believed to be the largest lake in the State. The area is a considerable distance from any oil or gas production. Interest in it has increased since several large producing wells have been completed to the east in Ellsworth and Rice Counties, which border Barton County. The new wildcat wells found in Ellsworth and Rice were drilled on what is called the Ellsworth arch, which is believed to cover approximately 200 miles of territory extending from Stafford County to Barton County.

During the week the Lario Oil & Gas Co. resumed shipping crude oil from its leases in the Ritz-Canton Field to the Globe Oil & Refining Co., a related concern, with a refinery at Blackwell, Okla. The Lario Oil & Gas Co. is believed to have the largest potential production of any company in the field. Its potential production on October 1 was 20,818 bbls. a day from 19 wells, an average of approximately 1,095 bbls. per well.

The wildcat test of Hilligoss and others' No. 1 Isern, NW cor. SE NE Section 12-20-11w, in the southeastern part of Barton County, was shut down at 3,280 feet to clear the titles. It is believed it will be several weeks before the test is drilled deeper. It is located several miles northwest of the Schurr Pool, in Rice County, and the log indicates that the formations are running slightly lower than the producing wells in the Schurr Pool.

The first announcement of a new location in the Goodrich Pool in Sedgwick County after the discovery of the deep pay horizon, was the Continental Oil Co.'s No. 1 in the SW cor. NW Section 15-25-1. The new location is west of the discovery well, which is located a half mile north of the other production in the pool.

Rice County Tests

Operations in the Schurr Pool include Slick, Pryor and Lockhart's No. 3 Schurr, NW cor. NE SW, Section 21-20-10w, drilling at 2,300 feet; C. B. Davis' No. 1 Kelly, SW cor. NW, Section 22-20-10w, on the edge of the field a quarter of a mile east of oil production, which was making 1,750,000 feet of gas a day from a shallow horizon.

Operations in the Welch Pool, in the southeastern part of Rice County, were steady. Rogers and others' No. 2 Rainey, SW cor. NW SE, Section 3-21-6w, was fishing for a bailer at 1,800 feet. Paul Gano Syndicate's No. 1 Brown, NE cor. SW, Section 10-21-6w, was drilling deeper at 1,900 feet after landing the casing at 1,810 feet. Allison and Fitzwilliam's No. 1 Walsten, NW cor., Section 2-21-6w, was drilling at 1,000 feet.

Unitized Block in Stafford

Leases in the area surrounding the Mid-West Exploration Co.'s No. 1 Richardson, in Section 36-22-12w, a wildcat well in Stafford County, have been unitized. The block consists of approximately 1,600 acres around the well, which has been shut in for some time. The well was opened recently when a pipe line and loading rack was built at Hudson, a few miles from the well and the Stanolind Crude Oil Purchasing Co. is buying the oil. The Mid-West Exploration Co. put seven quarter sections into the unit; the Atlantic Oil Producing Co., 160 acres, in the NE of Section 1-23-12w, while the Sunray Oil Co., J. A. Hull Co., Eason Oil Co., and Harrington each added an 80 acres out of Section 31-22-11w. The producing well was put into the unit at the ratio of two for one in oil, the original cost being placed at $54,000. The unit plan of development for the area has been placed at one test on each 40 acres in the future.

Butler County

Flint Hill Oil & Gas Co.'s No. 1 Martin "B," NE cor. SW, Section 27-28-4, has been completed for 1,000,000 feet of gas in sand 1,475-1,521 feet.

Chautauqua County

Leighty and Prairie Oil & Gas Co.'s No. 3 Lemert, SW cor. SE NE, Section 36-34-9, has been abandoned at 2,035 feet.

Cowley County

Roth & Faurot and Wakefield's No. 1 City of Winfield, Lot 1, Block 41, Musgrove Addition, is drilling deeper at 3,285 feet.

Ellis County

Davis and Hazlett and others' No. 1 Weiland, NE cor., Section 1-13-16w, is an old well drilling deeper at 3,043 feet.

Ellsworth County

Barnsdall Oil Co. and others made location for No. 1 Sohocht, SE cor. NW SW, Section 25-16-10w.

Greenwood County

Syndicate Oil Co. staked location for No. 8 Shock, SE cor. NW, Section 6-24-12. Stanolind Oil & Gas Co. and others' No. 6 Ellis, SW cor. NW, Section 27-23-11, has been completed for 171 bbls. in sand 1,882-1,932 feet.

McPherson County

Darby Petroleum Corp. is moving in on No. 3 Fletcher, SE cor. SW SW, Section 16-19-1w, Ritz-Canton area. Twin Drilling Co., Phillips Petroleum Co. and Shell Petroleum Corp.'s No. 1 Gratton, SW cor. SE, Section 19-19-1w, has been deepened from 3,433 feet to 3,436 feet and now testing. Olsen Drilling Co. and Shell Petroleum Corp.'s rig is up for No. 3 Johnson, NE cor. NW SE, Section 36-19-2w. Dieter, Youker and Shell Petroleum Corp.'s No. 2 Sellers, NW cor. SW, Section 19-19-1w, has been completed for a potential of 1,216 bbls. in Viola lime 3,396-3,417 feet. Abilene Oil Co. and Shell Petroleum Corp.'s No. 1 Garrett, NW cor. NE, Section 30-19-1w, has been completed for 680 bbls. potential on pump, producing from Viola lime 3,419-33 feet. Lario Oil Co. and Shell Petroleum Corp.'s No. 1 Boal, SE cor. NW, Section 24-19-2w, has been deepened to 3,398 feet in Viola lime topped at 3,390 feet and completed for 1,483 bbls. potential on the pump. Phillips Petroleum Co.'s No. 1 Morehouse, SW cor. NW NW, Section 3-21-3w, made 100 bbls. after being deepened from 3,409 feet to 3,411 feet.

Reno County

E. L. Study and others' No. 1 Houry, NE cor. SW, Section 1-23-4w, is preparing to deepen from 3,333 feet, where it was originally completed as a gas well.

Russell County

The Texas Company's No. 1 Jacobs, SW cor., Section 31-12-15w, an old well completed at 3,007 feet, is drilling deeper at 3,030 feet.

WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

BARTON COUNTY

Company, farm and location—	Remarks:
Syndicate Oil Co.'s No. 1 Boertz, NW SE SE, Sec. 13-18-12w	Shut down 2,440 ft.
Skelton Oil Co.'s No. 1 Ott, C SE SE, Sec. 16-19-14w	Drlg. 2,800 ft.
McCool et al's No. 1 Tsern, NW SE NE Sec. 12-20-11w	Drlg. 3,255 ft.

CHASE COUNTY

Borden et al's No. 1 Atkinson, NW SE Sec. 14-18-7	Rig on ground.

CLAY COUNTY

Crystal Oil et al's No. 1 Tivier, SW cor., Sec. 19-8-2	Shut down 2,700 ft.

COFFEY COUNTY

Heyburg's No. 1 Kroft, SE SW SE, Sec. 30-22-14	Shut down 1,565 ft.

COWLEY COUNTY

Slocum et al's No. 1 Union National Bank, C SW SW, Sec. 16-35-4	Drlg. 1,600 ft.

DICKINSON COUNTY

Severs et al's No. 1 Lavengood, NE SW, Sec. 13-13-2	Shut down 4,170 ft.

ELLIS COUNTY

Gypsy Oil Co.'s No. 1 Weiland, SE cor. Sec. 36-12-16w	3,051-59 ft. swbd. 14 bbls. an hr.; T.D. 3,073 ft.

ELLSWORTH COUNTY

Keyes Bros.' No. 1 Gregory, SW cor., Sec. 22-16-9w	Fishing 3,155 ft.
Alyward et al's No. 1 Stratman, SE NW SE, Sec. 1-17-10w	Silicious 3,255-71 ft.; 117 bbls. 2 hrs.; shut in; est. 2,000 bbls.; no pipe line connections.
Aladdin Pet.'s No. 1 Stoddenberg, C SW, Sec. 22-16-10w	Silicious lime 3,332-47 ft.; est. 1,500 bbls. a day; shut in.

FINNEY COUNTY

National Ref. Co.'s No. 1 Wells, C SW, Sec. 13-23-30w	Drlg. 1,365 ft.

(Continued on Page 70)

Clark County, Mississippi, Gas Sand

Urbana Field, Union County, Arkansas, Has Best Well for Some Time, Estimated 1,500 Bbls. Sixth Good Producer in Claiborne Parish, Louisiana

By J. R. Crumpton
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Oct. 19.—Although this division completed three oil wells, one of them the gusher type, and two good gas wells during the past week, recent developments in a wildcat in Clark County, Mississippi, makes it the center of interest. The test is the Gulf Refining Co.'s No. 1-A Long-Bell Lumber Co., Section 10-2n-16w, which cored 8 feet of likely looking sand with the bottom of the hole at 3,700 feet. The sand is brown in color, with streaks of green, and the former color is reported to be oil saturated with a distinct petroleum odor. The operators are arranging to set 6⅝-inch casing around 3,675 feet for a thorough test. The wildcat is about 5 miles east of Quitman on a solid block of about 8,000 acres assembled by this company.

Good Urbana Well

The Urbana Field of Union County, Arkansas, reported the best oil well completed in that state in some time. Wilson & Chapman's No. 1 H. Norman, Section 3-18-13, gauged 615 bbls. of pure pipe line oil the first 14 hours, and after more storage was erected, flowed 700 bbls. in 12 hours. The open flow of the new gusher will easily reach 1,500 bbls. daily when it cleans itself out. The pay is coming from 20 feet of broken sand from 3,563-83 feet, and is the thickest stratum of oil-bearing sand yet found in the Urbana Field. The new well is the third good producer in an extension of about 1 mile northeast of previous proven production, and development has been retarded because of buyers withdrawing from the field recently. Wilson & Chapman are the owners and operators of all the producing wells in this extension and have recently completed a loading rack to facilitate the marketing of their oil. The same operators completed their No. 1 A. H. Hadley, Section 3-18-13, as a 55-bbl. pumper with 14 per cent of the fluid salt water. This well was the first test drilled in the northern extension area and is about one-half mile west and south of the other producers brought in later. The well has been shut down since March of this year with 600 feet of fluid in the hole from a total depth of 3,570 feet. A comparison of the log of this well with the others indicates a thickening of the sand to the north and east and the play is expected to be in that direction.

The other producer was in the eastern extension of the Zwolle Field of Sabine Parish. Hawkins and others' No. 1 Moran, Section 1-7-11, was completed as a 25-bbl. pumper from 2,620 feet. Six miles east of the Hawkins well, near the center of the field, W. M. Contes' No. 1-B Sabine Lumber Co., Section 17-12, flowed an estimated 500 bbls. daily for two days from 2,306 feet and then went dead. The hole is now standing full of fluid with 500 feet of salt water from the bottom and will probably be rigged up to pump. Lanier & Dyer are waiting on standard rig for their No. 1 Barthold, Section 35-8-12, which has 1,600 feet of pipe line oil in the hole from a total depth of 2,521 feet.

Sugar Creek Producer

A high spot in the Trinity gas development of North Louisiana was the completion of the sixth good producer in the Sugar Creek Field of Claiborne Parish. The United Gas Public Service Co.'s No. 1 Treadwell & Hawk, Section 6-19-5w, was brought in with an initial flow of 29,270,000 feet of wet gas from 4,380 feet. The rock pressure registered 1,615 pounds with the gasoline content of the gas exceeding 1,000 gallons per million feet. When the well was blowing wide open there was a constant spray of gasoline in the air. The latest gasser is the farthest northwest producer of the group, all of which are in Section 6, with the exception of the first test, No. 1 Kilpatrick to the south in Section 7.

MISSISSIPPI

The Rankin County area of the Jackson Field in Mississippi reported a good gasser for the second consecutive week with the completion of Meredith and others' No. 1 Allen in Section 12-5n-1e. The well gauged an initial flow of 30,708,000 feet of dry gas from 2,375 feet. It is about 1½ miles east of Grandstaff and others' big gasser brought in last week in Section 11-5n-1e. In the Hinds County area of the same field, the Jackson Oil & Gas Corp.'s No. 3 Mayes, Section 2-5n-1e, was dry and abandoned at 2,518 feet. About 1½ miles east of the nearest production in the Rankin area, United Gas Public Service Co.'s No. 1 McLaurin, Section 8-5n-2e, tested salt water from 2,523 feet. Millsaps College, in the northern part of the field in the city limits of Jackson, Hinds County, has made location on its property in Section 34-6n-1e for a test. A recent completion in the residential section near the college campus was one of the best gas wells in the field. It is reported the United Gas Public Service Co. will contract the well and take the production if it is successful.

Dry Holes

There were seven dry holes reported in this division during the week, five of which were wildcats divided between three states. S. S. Meek, trustee's No. 1 Wagner, Section 5-12-14, De Soto Parish near Grand Cane, was dry and abandoned at 3,104 feet. This wildcat had aroused much interest because of a previous test about 1 mile north having produced from 5 to 15 bbls. of oil daily with salt water since its completion a year ago. In Vernon Parish, the Exchange Petroleum Co. abandoned its No. 1 White & Grandin, Section 29-3n-7w, at the shallow depth of 2,737 feet. This test was on a large block of acreage assembled in that vicinity and was expected to drill to deeper horizons. Olds & Smith's No. 1 Athey, John C. Byers Survey, Cass County in East Texas, topped the Georgetown lime at 3,651 feet and was abandoned at 3,656 feet. In Shelby County, north of the town of Timpson, Schultz and others' abandoned their No. 1 Hughes, J. Clay Survey, at 4,808 feet. A test in Adams County, Mississippi, the Arkansas-Louisiana Pipe Line Co.'s No. 1 Brandon Hall farms, Section 61-18n-1w, proved a disappointment. The total depth was 4,510 feet, at which depth it was dry and abandoned without a reported show of any productive formations anywhere along the log.

EAST TEXAS

There were no developments of interest in any of the other wildcats throughout the district. In Shelby County, East Texas, McRoby and others tested dry with a small show of gas on their No. 1 Windham, William Leach Survey. The test was made from 2,282 feet where several other wells in this vicinity have had gas showings, and the well will be deepened to the Woodbine formation. The United Gas Public Service Co.'s No. 11 Werner, D. B. Lewis Survey, in the Bethany Field of Panola County, passed up a good gas show at 3,665 feet in the Glenn Rose formation and is drilling to the Trinity horizon.

More Drilling Activity

Drilling activity seems to be on the upward trend, especially in Arkansas wildcat territory, and in Sabine Parish, Louisiana, surrounding the Zwolle Field. In Little River County, Arkansas, Stephens and others have derrick up on their No. 1 Dierke Lumber Co. in Section 29-12-21w, and the Tri-State Oil Co. is rigging up its No. 1 McCown, Section 34-8-32, in Sevier County, near the town of DeQueen. Sunby and others are arranging to resume drilling on their No. 2 Perdue, Section 33-16-14, in Union County. This well has been shut down for the past 12 months at a total depth of 3,247 feet. In Ouachita County, the M. S. M. Oil Co. is rigging up its No. 4 Arnold & Doyle in Section 23-16-15.

It is reported that the Gehrig Co. of Tulsa, through L. D. Higgins, secretary and treasurer, closed a deal with Hudson & Byrd, operators in the Zwolle Field, for a block of 605 acres northeast of production. The block transferred is in Sections 16 and 17, Township 8, Range 11, and derrick is being built for a test in Section 16. The consideration was $20,000 to be paid from oil. The Loring Oil Co. will make a deep test of its No. 18 Bowman-Hicks, Section 15-7-12, in the southern part of the field. The test was dry at the regular producing horizon as was the same company's No. 19 Bowman-Hicks in the adjoining section.

Daily Average Runs

There was an increase of 1,610 bbls. daily in the average runs from the fields of North Louisiana and Arkansas during the week. The Urbana and Zwolle Fields had the best increases for Louisiana while the Urbana Field of Arkansas jumped from 375 bbls. to 850 bbls. daily. Daily average runs for the several pools were:

North Louisiana	
Caddo light	6,095
Caddo heavy	1,490
Cotton Valley	350
De Soto and Red River	2,160
Elm Grove	380
Haynesville	4,660
Holly	385
Homer	2,780
Pleasant Hill	350
Sarepta-Carterville	875
Urania	3,610
Zwolle	6,370
Total North Louisiana	29,505
Total previous week	28,375
Increase	1,130
Arkansas	
Champagnolle	2,010
El Dorado	3,070
Lisbon	575
Nevada	1,110
Smackover light	3,120
Smackover heavy	26,520
Stephens	715
Urbana	850
Total Arkansas	37,970
Total previous week	37,490
Increase	480
Total both states	67,475
Total previous week	65,865
Increase	1,610

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

BOSSIER PARISH

Company, farm and location—	Remarks:
Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14	S.D. 2,890 ft.
Dr. W. N. Hankin's No. 1 Newell, 300 ft. S and W, NE cor., Sec. 12-19-11	Arranging to resume drlg. 1,350 ft
D. L. Perkins' No. 1 Ardis & Co., 1,127 ft. N, 198 ft. E, SW cor., Sec. 13-15-11	S.D. 1,004 ft.

CALDWELL PARISH

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4	Set 12-in. csg. 110 ft.
Hudson et al's No. 1 Burton, Sec. 35-12-2e	S.D. 2,950 ft.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMiller, 70 ft. N, 100 ft. W, C, Sec. 26-9-6	T.A. 3,097 ft.

CLAIBORNE—SUGAR CREEK

United Gas Public Service Co.'s No. 1 Treadwell & Hawk, 1,470 ft. S, 1,395 ft. E, NW cor., Sec. 6-19-5w	Testing 4,380 ft.

DE SOTO PARISH

Keatchie O. & G. Co.'s No. 1 Hallie Smith (was H. E. Weichert's), NE SE, Sec. 31-14-15	S.D. 2,350 ft.
Ben Merritt, tr.'s No. 1 Wallums, NE cor. SW SW, Sec. 19-12-12	Arranging to test 2,715 ft.
S. S. Meek, tr.'s No. 1 Wagner, 300 ft. S and E, NW cor. SE NW, Sec. 5-12-14	Dry and abd. 3,104 ft.
E. T. Oakes' No. 1 R. H. Bryant et al, 300 ft. N and W, SE cor. NE NW, Sec. 30-13-15	S.D. in chalk 2,930 ft.

(Continued on Page 62)

LOUISIANA-ARKANSAS PROVEN AREAS

NORTH LOUISIANA

CADDO PARISH—PINE ISLAND

Company, farm and location—	Remarks:
Shreveport Oil Corp.'s No. 2-B Muslow, 1,000 ft. S, 300 ft. E, NW cor., Sec. 32-21-15	S.D. 2,135 ft.
Simplex Oil Co.'s No. 1 Youree-Glassell, 500 ft. N and E, C, Sec. 13-20-15	Tested S.W; S.O. 2,275 ft.

CADDO PARISH—RHODESSA AREA

United Gas Public Service Co.'s No. 1 H. J. Bussa, Sec. 33-23-16, 990 ft. W and 660 ft. S of NE cor.	Set 9⅝-in. 3,625 ft.

MOREHOUSE PARISH

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 300 ft. S, NE cor., Sec. 2-20-4	Location.

OUACHITA PARISH

Carbon Consolidated's No. 7 Guthrie, Sec. 50-20n-4e, 5,263 ft. N and 7,475 ft. W of corn. of Secs. 25, 26 and 49, in Sec. 50	Location.

RICHLAND PARISH

Pelican Nat. Gas Co.'s No. 1 Alexander, Sec. 4-16-6, 660 ft. N and W, SE cor. Sec.	Rigging up.
Southern Carbon Co.'s No. 1 Pollard, Sec. 26-16-5e, 2,710 ft. S and 563 ft. W of NE cor.	Set 12½-in. 153 ft; set 8-in. 848 ft.
Southern Carbon Co.'s No. 6 Rosengraut & Ducomb, 2,640 ft. E, 1,980 ft. N, SW cor., Sec. 19-17-6	Location.
Southern Carbon Co.'s No. 7 Rosengraut & Ducomb, Sec. 24-17-5e, 696 ft. W and 660 ft. S, NE cor.	Drlg. 2,155 ft.
Southern Carbon Co.'s No. 8 Rosengraut & Ducomb, 2,546 ft. E, 660 ft. N, SW cor., Sec. 18-17-6e	Location.

(Continued on Page 64)

GARLOCK 7021

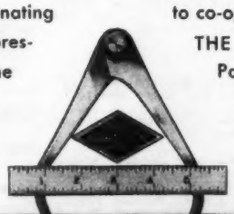
A Sheet Packing Developed to Meet the Severe Requirements of Oil Production and Refining Service

BUILT to withstand the extreme temperatures and pressures found in the modern refinery, Garlock-7021 sheet has met with universal success. It has been adopted as standard sheet packing in hundreds of refineries.

Garlock-7021 is a product which will stand up in service against hot oils and gasolines. Our files contain many reports of successful applications to heat exchangers, cracking stills, fractionating and bubble towers, wax presses, compressors, oil and gasoline pipe lines, gasoline storage tanks and, in fact, on every type and kind of producing and refining equipment. Garlock-7021 is furnished in all commercial thicknesses and in sheets 40″ x 40″ and larger. Gaskets cut from this sheet are styled Garlock-7022.

Without obligation on your part a Garlock Service Man will survey your entire operations and recommend suitable Garlock Packings and Gaskets for each requirement. We solicit the opportunity to co-operate with you.

THE GARLOCK PACKING COMPANY, Palmyra, New York. A World Wide Organization with Sales Offices and Warehouses in all Industrial Centers.



GARLOCK

New Deep Sand in Lockwood District

Two Tests in Eastern Fort Bend County Area. McFaddin Gas Field in Victoria County Extended. Is Being Closely Watched

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Oct. 19.—Although the initial production has been a little disappointing, Cullen & West and Gulf Production Co.'s No. 2-A Lockwood apparently has opened a new deep sand in the Lockwood (Thompson) Field in eastern Fort Bend County. The well came in late in the week flowing at the rate of 8 bbls. an hour through a five-eighths inch choke with pressure of from 20 to 70 pounds. The sand is at a total depth of 5,101 feet with 90 feet of 4¾-inch screen in the hole, and 2½-inch tubing to top.

Considering the showing made previously in the well and the amount of sand taken in, a much better well had been anticipated. The gravity of the oil is 25.7 degrees (corrected for temperature), which, although the oil is from a deeper horizon, is very similar to that from the shallower sand. It is expected, however, the well will show some improvement.

This well originally was completed last August in sand at a total depth of 3,179 feet. At that time it came in making an estimated 8,000,000 feet of gas with 175 bbls. of oil daily through an inch choke. Quickly going to water, it was deepened, finding the present sand. Location is 800 feet north, 20 degrees west of No. 1-A Lockwood & Sharp, the discovery well which is producing from sand at a total depth of 3,087 feet. The same operators' No. 3-A Lockwood & Sharp, 600 feet east of No. 2-A, completed the first part of this month as a high-pressure gas well in the shallow sand at 3,139 feet, has killed the gas and is now drilling deeper in search of the new deep sand.

Deep Test Showing Oil

Another well, in the south end of the Lockwood Field, also is in a deep sand showing oil, and over the week-end was preparing to test. This well, No. 2 A. P. George, is at a total depth of 5,174 feet, topping the sand at 5,123 feet and cementing 6⅝-inch casing at 5,115 feet. In this area there are three producing wells, all in sand around 3,500 feet. They are about half a mile to the south of the No. 1-A Lockwood & Sharp, the discovery well of the field.

Lockwood is one of this year's crop of new fields on the Gulf Coast, having been opened only last May. It is owned jointly by Cullen & West and Gulf Production Co. It is a geophysical prospect and is supposed to be a deeply seated salt dome although cap rock or salt has not been found yet. The shallower sand is in the Miocene while the new deep sand is reported in the Ogliocene.

McFaddin Gas Extension

The McFaddin gas field in the Bloomington district of southwestern Victoria County was extended approximately a half mile to the north the past week with the completion of United Production Corp.'s No. 5-A McFaddin. The well is estimated good for 30,000,000 feet of dry gas, 1,150 pounds pressure, through quarter inch chokes, with 20 feet of 4½-inch screen set at 3,760 feet. This is the fourth gas well completed in this particular area by United Production Corp. and Lion Oil & Refining Co., who own the block jointly, the former company taking over all gas wells and the latter any oil wells which may be completed. These wells do not include T. B. Slick estate's wildcat gas well 3½ miles to the north or The Texas Company's gasser 4 miles to the west, and which make a total of six gas wells in southwestern Victoria County.

New interest is being centered on Victoria County with the starting up of another wildcat on a block in the southeastern part of the county. Location of this wildcat is on the Keeran ranch in the Martin De Leon Survey and it is being drilled by Bunte and associates who have been assigned a block of 2,500 acres out of a block of 5,000 acres taken some time ago by Gulf Production Co. This is some 15 to 20 miles to the east and north of McFaddin district of southwestern Victoria County.

Fishing Jobs

Further developments in the McFaddin district are being held up by fishing jobs. The Texas Company's No. 3 McFaddin, a half mile to the north of this company's No. 2, a wildcat gas well, is fishing core barrel at 4,424 feet. This is being made a deep test for oil, although already it has passed up numerous sands in which gas wells could have been completed. Humble Oil & Refining Co.'s No. 1 O'Connor, about 3 miles to the west and just over the line in Refugio County, is fishing drill stem stuck when that well blew wild for four days two weeks ago. It is at a total depth of 3,814 feet.

That whole area continues to be one of the most watched districts on the Gulf Coast. A gas field of many sands and extensive proportions already has been proved by these numerous scattered high pressure gas wells and as Refugio and other oil-producing fields in the same line of play up the lower coastal plain got their start in the same way there is considerable speculation as to the possibilities in this more recent development.

Increase in Operations

The past week witnessed a further substantial increase in the number of active operations on the Gulf Coast with a number of new tests started up, locations made for others and with resumption of development in several additional areas where drilling has been suspended. Among new locations were several wildcats of particular interest.

In Matagorda County, United North & South Oil Co. made location and already has started drilling on a wildcat on the Stoddard ranch adjoining the townsite of Buckeye. The location is in the J. C. Keller Survey, 150 feet west and 545 feet north of the southeast corner of Block 53 of the townsite. At latest report this test had cemented surface casing at 1,149 feet. This is the second new wildcat started up in the county within the last several weeks, the other being Harvey Smith's No. 1 Boker on the Citrus Grove geophysical prospect. The latter is rigged up and ready to spud.

Montgomery County

Stanolind Oil & Gas Co. has made location in the Dobbins district of Montgomery County for No. 1 R. M. Gary, Jacob Shannon Survey, making the fourth wildcat started in that county since September 1. Although having no production to date, Montgomery County is being looked upon favorably and at present is receiving more attention than at any time in history. It is located just north of the coastal salt dome tier of counties.

Humble Oil & Refining Co. is preparing to resume drilling at Raccoon Bend where operations have been at a standstill since April, and has rigged up for No. 1 Martha Remmert. Location for this was made last January following the completion of H. R. Flannigan's No. 1 Deutrick, which was brought in as a gasser from shallow sand at 973 feet and which extended the field several thousand feet to the west. It is an eastward offset to the Deutrick well but following the abandonment of H. R. Flannigan's No. 2 Deutrick, 75 feet northeast of No. 1, as dry at 3,852 feet, the Humble location was abandoned.

Barbers Hill

Following the completion earlier in the week of J. S. Abercrombie, trustee's (Humphreys Corp.) No. 1 Ebanspacker, on the extreme northeast flank of Barbers Hill as a 1,500-bbl. producer from sand at 5,313 feet, as the most easterly well of that pool, location has been made by the same operator for No. 1 S. E. Morgan, which will serve as an additional link in proving up a continuous line of production from the northeast flank pool to production on the east flank. A rig is up for the Morgan test, which is 725 feet to the southeast around the dome from the Ebanspacker well and approximately 1,500 feet northwest of the nearest production on the east flank.

With the exception of the Ebanspacker well there were no other completions at Barbers Hill of interest. McAlbert Oil Co. deepened its No. 1 Woodward, an old well in the original deep sand area, to 5,376 feet where one joint of 3-inch screen was set. This well is flowing only a small amount of oil by heads. Drilling, on the other hand, continued active in the new play which is going on to prove up the recently opened shallow sand high up on the dome under the salt on the east flank. Several new locations were made during the week. A number of these tests now are nearing the sand. Sun Oil Co.'s No. 11 Wilburn, one of these tests, has picked up a stray shallow sand at a total depth of 2,594 feet and has cemented 10-inch casing to test. The sand being developed is around 4,500 feet.

Refugio Field

Moody-Seagraves Producing Co. has made location and rigged up for its No. 2-A St. John, a mile south of the Refugio Field. Two other tests, No. 1-A and No. 1-B have been drilled in that vicinity and were completed as small wells in a 5,500-foot sand. No. 2-A is 600 feet east of No. 1-A, No. 1-B being a west offset to No. 1-A.

Lockport Field

At Lockport, Vacuum Oil Co. has made location for another test, its No. 32 Miller, which is located in the old field. This is the first new operation in the main field in many months with development for some time being in the west extension pool. The new test follows the completion early in the week of No. 5-A Farquahar, in the west extension, which came in flowing 1,000 bbls. daily at 6,482 feet.

Standard Oil Co. is to drill two more tests on its Bayou Choctaw Dome, Iberville Parish, having made locations for No. 2 Myrtle Grove-Wilbert and No. 2 Gay. No. 2 Gay is 500 feet east of No. 1 Gay the discovery well, completed last June in sand at 4,353 feet. No. 2 Myrtle Grove-Wilbert is approximately a half mile to the northwest of No. 1, which is 250 feet west of the discovery well. No. 1 Myrtle Grove-Wilbert is trying to test a sand at 2,410-73 feet after encountering salt at 2,566-2,712 feet.

Cameron Meadows

Vacuum Oil Co.'s No. 2 Cameron Meadows, completed early the past week as the discovery well of the Cameron Meadows geophysical prospect in southern Cameron Parish, Louisiana, is standing shut in pending completion of storage facilities and arrangements for moving the oil out of the field. The well, which came in flowing 1,000 bbls. daily from sand at 5,273 feet, is in the marsh land along the coast and, water, being the only access, the oil will have to be transported by barge.

Gulf Refining Co. has completed a small pumper in its No. 28 Lutcher Moore, Starks Dome, Calcasieu Parish, Louisiana, in shallow sand at 1,204 feet.

GULF COAST FIELDS AND WILDCATS

Week Ended October 17

All Rotary

BARBERS HILL—CHAMBERS COUNTY

Mills Bennett Production Co.'s No. 5 Wilburn, Henry Griffith League, 350 ft. W of No. 4 in C of lease	Drlg. shale 4,206 ft.
Mills Bennett Production Co.'s No. 1 Gulf Fee, Henry Griffith League, 50 ft. out of NE cor., Strip 15	Drlg. out cement 1,341 ft.
Mills Bennett Prod. Co.'s No. 3 Gulf Fisher (W.O.), Wm. Bloodgood Sur., 600 ft. from S line and 50 ft. from W line of 25-ac. tr.	Coring hard cap 4,815 ft.
J. S. Abercrombie, trustee's No. 1 Ebanspacker, Henry Griffith League, 700 ft. from the N line and 70.6 ft. from the E and W lines of the tract	Set 2 joints 5-in. screen 5,313 ft.; comp. flowing 1,550 bbls. P.L.O., 17/32-in. choke, 463 lbs. pressure.
J. S. Abercrombie, trustee's No. 8-H Kirby, Henry Griffith League, 333 ft. W of No. 6-H Kirby and 70 ft. N of S line	Drlg. hard lime 2,846 ft.
J. S. Abercrombie, trustee's No. 2 Tarbutton, Henry Griffith League, 385 ft. from E line and 21 ft. from N line of tract	Drlg. shale and lime 4,078 ft.
J. S. Abercrombie, trustee's No. 3-B Barber, Henry Griffith League, 538 ft. from E line, 70 ft. from S line of tract	Spudded.
J. S. Abercrombie, trustee's No. 1 S. E. Morgan, 225 ft. N of S line in center of Strip 2 (4.4 acres), Henry Griffith League	Rig.
McAlbert Oil Co.'s No. 1 Woodward (W.O.), Wm. Hodges Sur.	Set 1 joint 3-in. screen 5,376 ft.; flowing by heads.
Sinclair Oil & Gas Co.'s No. 3 Wilburn, Henry Griffith League, 350 ft. W of No. 7 and 48 ft. from N line of tract	Drlg. lime rock 3,223 ft.
Sinclair Oil & Gas Co.'s No. 9 Wilburn, Wm. Hodges Sur., 50 ft. N of S line and 550 ft. W of No. 6	Derrick.
Sun Oil Co.'s No. 2 Winfree, W. D. Smith Sur., 50 ft. E of SW line and 150 ft. N of S line of tract	Drlg. sand 5,285 ft.
Sun Oil Co.'s No. 11 Wilburn, Wm. Hodges Sur., 550 ft. W of No. 8 and 50 ft. from N line of tr.	Sand showing oil 2,584-95 ft.; cem. 10-in. casing to test.
The Texas Company's No. 7 Wilburn, Henry Griffith League, 116 ft. S of Humphreys Corp.'s No. 8-H Kirby	Drlg. shale and lime 3,145 ft.
The Texas Company's No. 2 Lawrence, Henry Griffith League, 240 ft. from E line and 412 ft. from N and S lines of strip	Drlg. salt 2,666 ft.; top of salt 1,425 ft.

HUMBLE—HARRIS COUNTY

Sun Oil Co.'s No. 25 Bender, W. B. Adams Sur., 1,155 ft. from C of R.R. on an extension of the N line of the Bender North Addition and 3 ft. S	Drlg. shale 3,051 ft.

(Continued on Page 66)

Three Good Completions in Laredo Area

Ten New Locations in Southwest Texas. Schoolfield-O'Byrne Extension Has Good Well, Also Cole Gas Field and Escobas-Muckelroy Pool

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Oct. 19.—Three good wells were completed in the Laredo district last week and several important new locations announced while most of the operations elsewhere in Southwest Texas at the close of the week were still unfinished business.

In the Schoolfield-O'Byrne extension in north central Duval County, Humble Oil & Refining Co.'s No. 1 White, the farthest north test in the extension, came in flowing 412 bbls. the first 24 hours through 3-inch which makes it a good well. It did not show quite so good according to reports when first being completed but on final test seems to be about as good as the average. There is a mile of territory between this well and the main pool to the north and all of it owned by the Humble.

In the Cole gas field in Duval County on the east edge and the central part of the pool north and south, the Cole Petroleum Co.'s No. 70 Benavides, in Section 19, looks like a 100-bbl. well in sand at 1,730-36 feet. This is the regular gas sand of the field but some wells have shown a tendency to go to oil and especially the nearest test to this new well on the west. There is an oil producing spot at the north end of the field and on the east edge where Cin-Tex Oil Co. several years ago completed several wells and oil again at the south end of the field and on the east of the gas. No. 70 looks like the opening of another oil-producing spot the importance of which will develop as other tests are drilled. Another location has been staked farther east.

Escobas-Muckelroy Pool

The other good producer in the Laredo district was in the Escobas-Muckelroy Pool where F. H. Ethridge brought in No. 1 Bustamente in Share 35 of the Comitas grant about two-thirds of the way down measuring from the north end of the field. It is in the 1,500-foot sand and flowed over the top of the drill stem in eight minutes. This makes it look like one of the best wells in the field. There is more than one sand in that field. The discovery well near the extreme north end of the field got production at about 1,300 feet. Later at the south end of the field the deeper sand was picked up and some good wells completed.

In Webb County north of the Cole oil pool where Magnolia and W. G. French have developed an oil-producing spot both the Magnolia and French completed tests offsetting each other with total depth at about 2,343 feet. This is the same sand that is producing in the Cole oil field at the south and with gas production proven between the two oil producing spots. Both the Magnolia and French wells were average wells. It is the first drilling that has been done in that particular territory in many months.

There were only four completions in Southwest Texas last week and all of them were in the Laredo territory.

Pettus Area

It was expected over the week-end that both Buchanan & Lefevre's No. 1 Ray in the Pettus area and Neal, Milton & Kepley's No. 1 Roark in Nueces County would be completed. Everything was all set and the program was to bring them in.

Buchanan & Lefevre got the sand at 3,887 feet in No. 1 Ray compared to 3,918 feet in Damac's No. 1 Ray, the discovery well. Buchanan & Lefevre got a saturated core and did not make a drill stem test but proceeded to set casing. It is running so high it is expected to make a good well. This test is about 3,000 feet southwest of the discovery well and running so high is thought to indicate the field may extend for some distance to the southwest.

A fault cuts off this new pool from the Pettus Townsite Pool with less than a mile barren territory between them and the new pool must necessarily extend to the southwest as the fault cuts it off from the townsite pool to the northeast.

T. B. Slick's No. 1 Ray, 660 feet north of the discovery well, is now below 4,000 feet and drilling and dry. An acid bottle test showed the hole to be crooked but it later got the sand and tested it and is now much below it. This about settles the matter for the acreage immediately to the north of the discovery well.

Other than the Buchanan & Lefevre test the only remaining test in the field is United Production Co.'s No. 39 Ray in the northeastern part of the old Ray-McKinney Pool and interesting because of its depth. It is now down around 6,500 feet and has announced nothing of importance thus far.

Nueces County

The week-end was expected also to see the completion of Neal, Milton and Kepley Production Co.'s No. 1 Roark in the Saxet Field in a new sand. This well is watched with keen interest. If it makes a big well it will certainly attract a lot of attention to that field and the coast and open up a new line of drilling. Taken in connection with the old Independent Oil & Gas Co.'s No. 1 Baldwin, it is also likely to start a new line of drilling activity running south from No. 1 Roark.

Gulf Coast Oil Co.'s No. 1 Elder, some distance to the west, is down about 4,800 feet and will be watched with interest but the location of the anticline as mapped out would seem to place this test on the west flank rather than the east and if it comes in dry in that sand it will merely help to locate the structure. The same company's No. 1 Sagarin is still farther west and is now down below 4,000 feet and drilling. There is nothing on the east flank drilling at this time. Saxet Oil Co.'s No. 1 McCampbell is located about in the trend of the anticline south of No. 1 Roark but it is reported as having been completed as a gasser in one of the shallower sands.

The possibilities of the country making an oil field of good profitable production after the completion of No. 1 Roark will therefore have to wait on the making of some new locations.

San Patricio County

Saxet Oil Co. has started rigging up on its No. 18 Rachel in the White Point Field north of Nueces Bay and it is understood this will be a deep test. No. 17 Rachel got a little oil in deep sand. Geologists point to the possibility of a syncline between the Saxet Field south of the bay and the White Point Field north of the bay. However, any deep test in the White Point Field is of great value to the knowledge of geology and there is also the possibility that there is no syncline in the bay and that production will extend across it. Practically all of Nueces Bay is under lease.

Ten New Tests Starting

Southwest Texas last week kept up its record of slight increase in activity with the announcement of 10 new locations, most of them in the Laredo district.

Thomas & Tarver, Inc., made location for No. 1 Welder-Wood in the northern part of Duval County near the north line of the county in Survey 102, located 500 feet from the north line and 4,230 feet from the west line of the survey. This is a little to the northwest of where other operators have done some drilling in the past in hope of opening a new pool and in a general way it is on up the escarpment several miles from the Schoolfield-O'Byrne Pool.

S. R. C. and Vacuum Oil Co. have made a location for their No. 5 Duval Cattle Co. in Survey No. 293, 8 miles northwest of the Schoolfield-O'Byrne Pool. Early in the year they drilled a hole in that area and got oil at around 1,700 feet, missed the direction the field would take and drilled two dry holes to the east and later found the trend of

(Continued on Page 47)

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

ATASCOSA COUNTY

Company, farm and location— Remarks:
Glen Mathis' No. 2 Mrs. C. Martin, 100 ft. SE of No. 1...T. D. 2,980 ft.; shut down.

BLANCO COUNTY

Hardy-Sitton's No. 1 McMillan.....T. D. 602 ft.; shut down.
Theo. Hicks' No. 1 Specht, 1,500 ft. from S line, 500 ft. from W line of farm in Thomas M. Fowler Sur. No. 27 in extreme south point of county.....T. D. 960 ft.; fishing.
Liles Adams et al's No. 1 Luders, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155.....T. D. 1,100 ft.; standing.
McCleary et al's No. 1 Schenling, 900 ft. to SE line, 600 ft. to S line of J. A. Rouse No. 118 Sur., 4 miles SW from Blanco City.....T. D. 574 ft.; shut down.
C. Rosenfield's No. 1 Hohenberger, 800 ft. to W line, 1,360 ft. to N line, Sur. No. 94.....T. D. 712 ft.; shut down.

BASTROP COUNTY

W. A. Allen's No. 1 Birmingham, James Stewart Sur.....T. D. 1,215 ft.; no report.
Texas Dev. Co.'s No. 1 C. H. Ray, 800 ft. from W line and 400 ft. from S line of farm in Thos. Christian Sur. .....Spudded and shut down.

BELL COUNTY

Field & Lange's No. 1 Stubblefield, 450 ft. from S line and 150 ft. from E line of farm in Antonio Manchaca Sur. .....T. D. 410 ft.; drlg.
J. W. Riley's No. 1 W. S. Chaffin, in M. Griffin Sur.....Spudded and shut down.
James Scroggins' No. 2 Warrick, Ingram Sur.....T. D. 1,425 ft.; fishing.

BEE COUNTY

Alexander et al's No. 1 McFall, 2 miles S Skidmore.....T. D. 1,870 ft.; no report.
Hughes et al's No. 1 Martin, 1,000 ft. S of Simms Oil Co.'s No. 1 Holzmark in John Lyford Sur.....Rigging up.
Humble Oil & Ref. Co.'s No. 1 Laura Thompson, 6,360 ft. from N line, 15,100 ft. from W line of tract in Garrett Roache Sur., S part of county.....T. D. 1,800 ft.; drlg.
Mauldin et al's No. 1 Kimball, 300 ft. S Grayburg's No. 1-A Kimball, S. Winship Sur.....T. D. 3,544 ft.; standing.

BEXAR COUNTY

Callahan Final Oil Co.'s No. 1 B. H. Buck, 900 ft. to E line, 3,200 ft. to S line of farm in J. M. McGamley Sur. .....Rigging up.
J. E. Anderson's No. 1 Suburban Irrigated Farms, 500 ft. to N line, 600 ft. to E line of C. Logan Sur.....T. D. 960 ft.; drlg.
Ingersoll-Miller's No. 2 Carruth, 3,900 ft. S, 2,500 ft. W of NE cor. of tract in Francisco Bolen Sur.....T. D. 480 ft.; standing.
Dr. Ewell Neil's No. 1 J. Watson, 500 ft. from W line, 1,700 ft. from S line of B. Martinez Sur.....T. D. 1,100 ft.; waiting on drill stem.

(Continued on Page 66)

SOUTHWEST TEXAS PROVEN AREAS

DOBROWOLSKI POOL—BEXAR COUNTY

Company, farm and location— Remarks:
W. S. Rogers et al's No. 1 L. Dunnop, Juan Montes Sur. .....T. D. 612 ft.; shut down.
Gatlin Oil Co.'s No. 9 Beck .....Making location.
Whipple et al's No. 1 Gembler, 3,000 ft. to S line, 150 ft. to E line of A. Manchaca Sur. .....Location.

PETTUS POOL—BEE COUNTY

J. L. Mauldin's No. 1 fee, 1,300 ft. N of S line, 150 ft. E of Medio Creek, Kerr County.....T. D. 3,930 ft.; standing.
Geo. N. Moore et al's No. 2 Freeland, in John Pace Sur., 1,000 ft. from S line, 600 ft. from E line of survey...T. D. 4,297 ft.; standing.
United Prod. Co.'s No. 39 Ray, 1,130 ft. to SE line, 2,396 ft. to SW line of T. Hanson Sur.....T. D. 6,152 ft.; drlg.
T. B. Slick estate's No. 1 Ray, in Kerr Sur., 210 ft. W of NE cor. of John W. Williamson Sur. and 330 ft. N of N line of same survey (location changed).....T. D. 4,056 ft.; drlg.
Buchanan & Lefevre's No. 1 Ray, 3,154 ft. from E line, 150 ft. from N line of John W. Williamson Sur.....T. D. 3,888 ft.; set csg.
H. H. Weinert's No. 1 Ray, 150 ft. from N and E lines of lease in John W. Williamson Sur. .....Derrick.
Houston Oil Co.'s No. 2 Portis, 330 ft. from N and W lines of A. Smalley Sur. .....Location.

BRUNER POOL—CALDWELL COUNTY

Joe Bruner's No. 1 Malone, 150 ft. to N line, 750 ft. to W line of tract, A. Floyd Sur.....T. D. 2,572 ft.; set csg.; standing.

S.R.C.-VACUUM POOL—DUVAL COUNTY

S.R.C. & Vacuum Oil Co.'s No. 5 Duval Cattle Co., 150 ft. W, 330 ft. N of No. 1 .....Location.

COLE FIELD—DUVAL COUNTY

Cole Petroleum Co.'s No. 70 Benavides, 360 ft. to NE line, 660 ft. to NW line of Lot 8, Sec. 19, Arispe grant.T. D. 1,736 ft.; complete 100 bbls.

SCHOOLFIELD-O'BYRNE POOL—DUVAL COUNTY

Magnolia Petroleum Co.'s No. 5 Wilson, 330 ft. from N line and 1,920 ft. from W line of Sur. No. 134 .....T. D. 1,428 ft.; drlg.
Humble Oil & Refining Co.'s No. 1 White, 330 ft. from S line, 1,650 ft. from W line of Sur. No. 58.....T. D. 2,349 ft.; flowed 412 bbls. in 24 hours.

CAMP POOL—GUADALUPE COUNTY

John F. Camp's No. 1 Dan Denman, 150 ft. to N line, 450 ft. to E line of tract in Wm. Arrington Sur.....T. D. 2,307 ft.; drlg.
Humble Oil & Refining Co.'s No. 1 Dan Denman, 450 ft. to N line, 150 ft. to W line of lease in Wm. Arrington Sur. .....T. D. 750 ft.; drlg.

WALSH POOL—JIM WELLS COUNTY

Larcro Petroleum & Gas Co.'s No. 2 Wade, 800 ft. S of No. 1 .....T. D. 2,355 ft.; drlg.

(Continued on Page 66)

Interesting Morgan County Wildcats

Colorado Developments Center of Attraction in Rocky Mountain Area. Five Operations Under Way in Hobbs Pool, New Mexico

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Oct. 19.—The Colorado Associated Oil Co.'s No. 1 Pumphrey, on the North Fort Morgan Dome in Morgan County, Colorado, reached the Muddy sand 600 feet higher than expected. Oil scouts were denied admittance when the sand was cored and reports it was saturated have not been confirmed. The Indian Territory Oil Co.'s Fort Morgan test has gone through the Muddy and Dakota sands and found both dry. Prairie Oil & Gas Co. is ready to spud in one of its wildcats and is starting another to the northwest of the Greasewood area. Two wells at Greasewood are ready to drill in.

Five operations are now under way in the Hobbs area in New Mexico. A deal has been closed whereby a block northeast of the Artesia Pool is to be developed following the winding up of an estate. Continental Oil Co. completed a 75-bbl. well in the Dakota on the Rattlesnake Dome.

Utah reports a gas well that has created a geyser in a game refuge. It was drilled for water.

The Midwest Refining Co. is ready to drill in a test on the Frannie Dome in Wyoming that will mean an extension of the pool. Resolute Oil Co. is preparing to drill two deep rotary tests on the Badger Basin Dome. The Neiber Dome test of Ohio Oil Co. looks discouraging.

Montana has two near completions in the Cut Bank gas field which will extend the proven area 2 miles.

COLORADO

Morgan County

The Morgan County wildcats took precedence over all others in the news this week, though the news is confined very largely to rumors. These arose out of the coring of the Muddy sand in the Colorado Associated Oil Co.'s No. 1 Pumphrey, C SE SE, Section 14-4n-58, North Fort Morgan Dome. This wildcat spudded in July on a block of 17,000 acres to which several companies contributed acreage. Midwest Refining Co. turned in some acreage and furnished the rig. The structure had been mapped by the Midwest, but the acreage was not drilled on account of its curtailment program then going into effect. The structure was supposed to be about 70 feet higher than the Greasewood Dome, 20 miles to the northwest. It is about the same distance north of the block being tested by the Indian Territory Illuminating Oil Co. Drilling disclosed that the structure was much higher than surface geology indicated. The Hygiene was cored at 2,897 feet and was found about 100 feet higher than expected. There was a slight show of gas in that formation. The Timpas was cored at 5,325-47 feet and this indicated the structure was 600 feet higher than original calculations and would put the Muddy at around 5,750 feet. Yesterday it was drilling at 5,690 feet and plans were made for coring into the Muddy today. Rumors have been flying thick and fast that the cores showed good saturation, but no official confirmation has been given out. The scouts were not permitted to visit the well and two deputy sheriffs were placed in charge. No one knows outside of those immediately in charge what has taken place and they are not saying anything. The only casing run was the conductor pipe. Arrangements were made for a string of 8⅝-inch to be shipped from Chicago as soon as needed. It was understood no string would be run until the sands were cored and the possibilities disclosed. One of the rumors originated out of a report that the string of casing had been ordered shipped. The company is supposed to have all the acreage on the structure that is open for leasing and no reason for withholding the results is apparent.

If the Muddy was encountered at the revised depth of 5,750 feet, then the structure is approximately 700 feet higher, based on sea level datum, than the Greasewood Dome 20 miles to the northwest, and about 180 feet lower than the Indian Territory well.

Indian Territory Illuminating Oil Co.'s No. 1 State, C NE NE, Section 16-1n-57, Fort Morgan anticline, was drilling at 5,845 feet on October 10. Official reports give only the drilling depths, but other information that is being generally accepted as reliable, is that it cut the Muddy sand at 5,572-5,602 feet and found it bone dry. The Dakota was found at 5,654-74 feet and likewise was dry. It is bottomed between the Dakota and the Lakota and it is understood plans are to continue drilling until it runs out of hole. The Dakota was a fine-grained sand barren of oil, gas or water. This sand blankets the entire country out here and is consistently a water sand except in structures where oil accumulates. The fact that it was dry in the Indian Territory well is somewhat of a puzzle. Some geologists express the opinion that the hydrostatic pressure that far out from the mountains is not sufficient to lift the water to that elevation and that it may be circulating around the dome, or the well may have been drilled in a fault block which shut off the water. The elevation of the well is 4,468 feet above sea level, which puts the Muddy at 1,-104 feet below sea level, as against 1,-992 feet below sea level at Greasewood, or 888 feet higher.

Some interesting figures as to highs in eastern Colorado are found in an old well reported to have been drilled on the Roundtop Dome to the north of the Indian Territory well and on the east flank of the Fort Morgan arch. The well record is not available, but hearsay figures give the depth to which it was drilled at 1,750 feet where it was in a sandy shale that is identified as the Hygiene. The Hygiene in the Indian Territory well was found at around 2,600 feet. There is not much difference in the surface elevation. These figures put the Roundtop Dome about 850 feet higher than the Indian Territory well. William Meyers and associates, who recently took over the Lee acreage in that district, have made a location in the C NE SW, Section 6-2n-56, and cellar and slush pits have been dug.

Prairie Oil & Gas Co.'s No. 1 Mortier, C NE NW, Section 2-5n-60, Jackson Lake area, is rigged and ready to spud. This is a rotary operation to the southeast of Greasewood.

Greasewood Area

Several deals for acreage and drilling agreements and the spotting of offsets in the Greasewood area are being held up awaiting the outcome of the Continental Oil Co.'s No. 1 Gadbois, C SE SW, Section 24-6n-61, the next well due for completion. This well is half a mile south of the discovery well and will be the first to reach the sand in that direction. The 7-inch was cemented at 6,578 feet and at that depth change to cable tools to drill in is taking place. No definite date for drilling in has been set, but it is probable operations will be resumed at once. So far no material difference has been shown in the elevation of the Muddy sand in the three wells drilled into the pay and it is not considered likely the Continental's No. 1 Gadbois will show much variation. A core taken in the Timpas showed lime at 6,-220-22 feet with shale above and below. Based on this marker, the Gadbois well is running about 5 feet lower than No. 1 Patterson, the discovery well, half a mile to the north. This will give a strip a mile long in which there is hardly a difference of more than 5 feet in the elevation of the wells, indicating a broad flat structure or, as some are beginning to believe, a flat terrace.

Several offsets which ordinarily would have been spotted by now have not been located and it is presumed these are being held up pending further completions in the field, or the outcome of deals. Platte Valley Petroleum Co. has the lease on the Niles tract in the E half, Section 13-6n-61. This calls for an offset on the east to the Continental Oil Co.'s No. 1 Briggs. The Platte Valley company is reported negotiating for the drilling of this offset with one of the major companies. Unless good intentions are shown shortly, steps to cancel the lease may be taken. Sinclair Consolidated Oil Corp. is reported to have sent a group of geologists and land men into the field to work out of Greeley, but considerable secrecy surrounds these moves and their presence is not definitely confirmed. Continental Oil Co. owns the lease on the Briggs tract which offsets on the east the Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, which is nearing completion, but no location has yet been announced. The Reiter-Foster company has the Behring tract which offsets the Johnson-Juhl well on the south, and also has the Patterson 80 in the N half SW, Section 24 which offsets the Gadbois tract upon which the Continental company is about to complete a well.

Continental Oil Co.'s No. 1 Briggs, C SE SW, Section 13-6n-61, was deepened 9 feet this week to a total depth of 6,675 feet, 36 feet below the top of the sand. There was no material change in production which on October 12 was 648 bbls. in 24 hours. This well made 930 bbls. on September 29, the first day after reaching a depth of 6,664 feet. It averaged 782 bbls. daily for the first eight days of October.

Platte Valley Petroleum Co.'s No. 1 Patterson, NE SE NW, Section 24-6n-61, the discovery well which came in a year ago, is showing a gradual decline and is now making 140 bbls. naturally per day. This is a drop of 60 bbls. from its production the first day after being deepened to 31 feet in the sand.

Reiter-Foster Oil Co.'s No. 1 Ida Johnson, C NE NW, Section 24-6n-61, was deepened this week to 6,656 feet, 14 feet in the sand, but no increase was reported. It is making 350 bbls. per day at this writing, and averaged 442 bbls. daily after its flow was restored a week ago.

The three producers are now making around 1,138 bbls. daily, all of which is being lifted more than 6,600 feet. This is a heavy pull on the gas and it is evident the sand must be repressured, gas lift installed, or the wells pumped to get a maximum production.

Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, C SE SE, Section 14-6n-61, half a mile west of No. 1 Briggs, is bottomed at 6,400 feet and waiting for the string of 7-inch pipe. The Timpas lime is reported to have shown a little oil in the core. The well is running approximately 3 feet higher than No. 1 Briggs.

Greeley Oil Co.'s No. 1 Gadbois, C NW NW, Section 25-6n-61, an offset on the south to the Continental's No. 1 Gadbois, is bottomed at 6,300 feet and waiting for pipe. The conductor pipe is the only casing so far put into the hole. If its offset comes in as a producer, the 9⅝-inch probably will be run to around 5,500 feet.

Ohio Oil Co.'s No. 1 Gadbois, C SW SE, Section 24-6n-61, and No. 2 Gadbois, C NE NW, Section 25-6n-61, are building camp, setting tanks and making preliminary preparations for drilling.

Aztec Corp.'s No. 1 State, C NE NE, Section 16-6n-61, to the northwest of the producers, is standing with 15½-inch set at 110 feet. It is understood a deal for the drilling of this well will be announced within a day or two.

Reiter-Foster Oil Co.'s No. 1 Wilson, C NE SE, Section 24-6n-61, spudded with a machine and probably will make slow progress until one of the rotaries is released.

On the Morgan County side, Independent Oil & Refining Co.'s No. 1 Schmidt, C NE NW, Section 19-6n-60, is moving in, and Tulsa-Fort Morgan Oil Co.'s No. 1 Emil Smith, C SE SW, Section 18-6n-60, remains a location.

Weld County

In Weld County outside of the Greasewood area, one important new location was announced. This was Prairie Oil & Gas Co.'s No. 1 O'Toole, C SE NE, Section 33-7n-62, in the Crow Creek district, 7 to 10 miles northwest of the Greasewood operation. The company has a block of upward of 10,000 acres gathered by Brimmer and Weeks of Cheyenne, and turned to the Prairie company. Ross Heaton did the prelimiary geological work which was checked by the Prairie staff. The contract for the well has been let to Sultan Drilling Co. and rotary rig has arrived at Cornish, 4 miles away on the Briggsdale-Greely branch of the Union Pacific Railroad. A water line will be built from a connection with the line being laid from the Riverside reservoir to the Aztec well in the Greasewood area, which is being constructed by the Sultan company.

To the south and west of this wildcat Gulf States Oil Corp. expects to begin drilling within a week or two in its No. 1 Bengston, C NW NW, Section 6-4n-63, on the Box Elder structure. This wildcat will be drilled with cable tools.

In the Brighton district, Retter Oil Co.'s No. 1 Smith, C E half, Section 14-1n-66, is drilling at 1,377 feet after cementing 12½-inch at 1,262 feet. This hole was drilled to 1,171 feet several years ago and at that depth was in a sand. It was not in good shape and when George E. (Dad) Retter resumed operations last month it was filled back and redrilled from around 800 feet to straighten. The new hole is said to have cut the old hole twice, but to have missed the sand at 1,100 feet. Instead, it picked up a sand formation that was very fine-grained and almost like quicksand. Several who examined the samples say it is similar to a Mid-Continent sand that is found in a much older formation than that in which the well ordinarily would be drilling. The formations do not at all correlate with those in the Greasewood wells and Mr. Retter expresses the opinion that a fissure may have been cut. Rainbows of oil and some gas are showing in the formation. At 790 feet this well had a sand which looked as if it might make 15 bbls. of oil per day if pumped.

Arapahoe County

MacDeb Drilling Co.'s No. 1 Fitzsimmons, NE, Section 7-4s-66, near Aurora,

made 30 feet of new hole the past week, the first increase in depth since last June when it was reported having a show of oil in sand. The former total depth was 5,835 feet, but upon changing crews recently, it was measured and a corrected depth of 5,755 feet established. It is now drilling at 5,785 feet in shale and has not yet entered any sand, though there is a small show of oil.

Adams County

Hills Dome Lease Development's No. 1 Hills, SE cor., Section 27-3s-64, near Watkins, which has been shut down for several weeks pending the probating of the Nettie M. Slatt estate, has resumed. A new cable has been installed and drilling is resuming at 3,720 feet.

Jefferson County

Ruby Hill Oil & Gas Co.'s No. 1 Braden, SE cor., Section 24-4s-69, near Denver, is drilling at 3,965 feet.

Lincoln County

Eastern Colorado Oil Co.'s No. 1 State, SE cor. NW, Section 36-14-57, near Hugo, is bottomed at 3,425 feet, supposedly a few feet off the Dakota, and is still delayed by a fishing job. No new hole has been made for several weeks.

El Paso County

Utemoor Syndicate's No. 2 Carson, NW NE NE, Section 10-16s-66, Fountain district, is shut down at 1,125 feet, and is expected to resume shortly. The well is a few hundred feet from No. 1 Carson which at 1,900 feet was reported to have had a good show of gas. The quantity was sufficient to furnish fuel for No. 2 until the well caved and the hole was lost. The formations are reported to be running 1,500 feet higher than on the structure to the east where Ohio Oil Co. and Phillips Petroleum Co. drilled tests several years ago. No. 1 Carson also had a show of gas at 1,252 feet. No water was encountered in any formation drilled.

Park County

South Park Oil Co.'s No. 1 Eches, Muleshoe Dome, SE cor. NW, Section 5-9s-76, is shut down at 2,465 feet for casing. South Park Oil & Gas Co.'s No. 1 Milligan, NE cor. SE, Section 13-8s-76, near Jefferson, is drilling at 2,480 feet.

Rio Blanco County

Magnolia Petroleum Co.'s No. 1 Maddock, C NW SE, Section 9-2s-96, Piceance Creek, is bottomed at 1,532 feet in gray sandy shale and has underreamed and set 13⅜-inch to make a water shutoff.

California Co.'s No. 1 California-Raven, NW SE, Section 30-2n-102, Rangely Dome, is drilling at 2,761 feet in the Mancos shale.

Archuleta County

Standard Oil Co. of Colorado's No. 1 Fitzhugh, NW SE SW, Section 34-33n-1e, Chromo Dome, is shut down at 613 feet in the middle shale member of the Dakota group. The 10-inch was set at 504 feet and at 509 feet it entered the Dakota. There was a show of oil in the top followed by water. It passed out of the sand at 537 feet into blue shale and 8¼-inch was set at 545 feet. A sand was then cut at 555-601 feet, showing saturation in the top followed by water.

La Plata County

J. W. Irwin & Co.'s No. 1 Doescher, SW cor. NW, Section 29-33-13w, Dry Mesa, is drilling at 3,100 feet and is believed to be on top of the Dakota. It had a show of oil at 2,660 feet.

NEW MEXICO

Lea County

Five operations are now active in the Hobbs area, of which four are in the southeastern part of the Hobbs Pool, and one 2 miles to the southwest of the nearest producer. Gypsy Oil Co.'s No. 1 East Grimes, SW NE SE, Section 33-18-38, cemented 9⅝-inch at 2,741 feet with 600 sacks and is waiting. It cut the salt at 1,690-2,560 feet. Midwest Refining Co.'s No. 26 State, NW SE SE, Section 33-18-38, spudded on October 5 and is bottomed at 110 feet in a water sand. Same company's No. 8 Byers, SE NW NW, Section 3-19-38, has cellar and pit completed. Continental Oil Co.'s No. 4-B State, NE NW SE, Section 33-18-38, is drilling at 1,855 feet in salt. It topped the anhydrite at 1,565 feet and the salt at 1,690 feet. Pacific Coast Oil Co.'s No. 1 Blakey, C SW NW, Section 28-19-38, to the southwest of production, is moving in.

Culberson & Conrad's No. 1 State, C NE, Section 22-18-34, Caprock area, is drilling at 4,850 feet in broken lime. It had another slight show of gas at 4,750 feet.

Eddy County

Some promising territory about 4 miles northeast of the Artesia Pool which has not been drilled to any extent on account of the acreage being tied up in an estate, is to be developed by the Western Drilling Co. as a result of a deal recently closed. The acreage belonged to the A. R. Ramage estate and consists of 640 acres under a Federal lease and 160 acres under a state lease, principally in Section 29-17-29, and has been transferred to Arba Green, who made a deal with the Western Drilling Co. The tract lies south of the Leonard & Levers gas wells. One well was abandoned on the tract and another is a producer. Western Drilling Co. is moving in for a gas well to be drilled in the NW cor., Section 29-17-29, and a test will be drilled for oil when a development program is worked out.

Flynn, Welch & Yates have started another well in their No. 61 State, SE NW NE, Section 32-18-28, Artesia area, which is drilling at 250 feet with 10-inch at 220 feet.

DeBaca County

Landowners Oil Co.'s No. 1 McAdoo, SW cor. NE, Section 16-1s-27, Buffalo Creek, is drilling at 4,591 feet in brown shale. It has had several shows of gas below 4,531 feet.

Guadalupe County

New Mexico Producing & Refining Co., Ltd.'s No. 1 McMillan, SW cor., Section 24-5n-16, Mesa Leon district, is drilling at 2,500 feet in red shale.

Mora County

Fulton Petroleum Co.'s No. 1 Santa Fe-Dioice Co., NE cor., Section 14-19-21, which was drilled to the top of the Santa Rosa sand and cased with 8¼-inch at a total depth of 1,312 feet, about four months ago, is still standing at that depth. This well was drilled for carbon dioxide gas with which to manufacture dry ice. The quantity of gas encountered is supposed to be ample for such a plant. This company is now operating a dry ice plant in Utah.

San Juan County

Continental Oil Co.'s No. 25, NE NW SE, Section 2-29-19, Rattlesnake Dome, was completed in the Dakota series at 855 feet and is estimated at 75 bbls. per day on the pump. It topped the sand at 705 feet. Same company's No. 24, SW NW SW, Section 1-29-19, its second deep well to the Pennsylvanian formation, is drilling at 5,912 feet after being delayed by a cavity at 5,801 feet. After pumping in 15,000 bbls. of mud with which was mixed a carload of cottonseed hulls, the cavity was filled and drilling resumed. It has about 700 feet to go to reach the objective. The company's No. 17, C NE, Section 2-29-19, the discovery well in the Pennsylvanian, which has been on production for more than a year, is being worked over and has been connected up and is preparing to swab through tubing. Total depth is 6,790 feet. It made originally 600 to 800 bbls. of oil per day with considerable water from above which could not be shut off. The oil separates from the water very easily and the well has produced around 360,000 bbls. to date.

R. C. Oswell's No. 2, NW NW, Section 34-30-11w, between Aztec and Bloomfield, is bottomed at 990 feet with 8¼-inch cemented at 962 feet. At this depth it gauged 550,000 feet of gas with a pressure of 200 pounds in 24 hours. The gas is coming from the upper series of the Farmington sands. It will be carried down to a sand which showed oil at 1,323-65 feet in a well drilled 200 feet to the north several years ago after water had stood on the sand for three years.

Rio Grande Development Co.'s No. 2 Lanier, SE cor. NW, Section 9-29-11, Bloomfield district, is bottomed at 1,770 feet and underreaming 6¾-inch from 1,500 feet to shut off cavey ground. This well had shows of gas in the Farmington series and has the Picture Cliff for the objective. It is believed to be close to the top of that formation.

Ortega and others' No. 2 Ute, NW NW, Section 24-31-16, Westwater Dome, is cleaning out and drilling on iron at 2,190 feet.

Kutz Canon Oil & Gas Co.'s No. 1 Day, SW cor., Section 20-28-10, Kutz Canon district, is shut down for casing at 3,635 feet. At this depth it had some salt water.

Reserve Oil Co.'s No. 3, NW SE SE, Section 36-22-14, Stoney Butte, has plugged back from 819 feet to 816 feet to shut off bottom water and has 2 feet of saturated sand.

Rio Arriba County

Governardo Dome Oil Co.'s No. 1, SE, Section 15-29-7w, is drilling at 1,747 feet with the sands in the Picture Cliff formation as the objective.

Torrance County

Fisher and others' No. 1, NE NW, Section 6-10n-7e, Barton Dome, is reported spudding in a test that has carbon dioxide gas for its objective.

UTAH

Reports of a well drilled for water by the National Park Department of the Department of the Interior in the Bear River Bay game refuge in Box Elder County, 17 miles west of Brigham City, which is making 1,000,000 feet of gas from a total depth of 430 feet is carried in the Inland Oil Index. The well is just north of the Great Salt Lake, and is reported to be blowing water, mud and gas after making a crater 20 feet wide and 10 feet deep. It blew in August 19 carrying away 20 feet of conductor pipe which had not been cemented. The park service was reported to have appealed to the geological survey to assist in shutting in the well, but as no transfer of funds had been arranged, it was stated no work had been done and there was little likelihood of being able to get it under control since it has become more of a geyser than anything else. The hole was drilled by a hydraulic jetting machine and the gas blew in after it had gone through a 6-inch shell. Several wells which yielded gas at shallow depths have been drilled in that area in the past 40 years. Several deep tests have been drilled in recent years farther to the west.

Utah Southern Oil Co.'s No. 1 Balsey, C NE NE, Section 31-23-21, Salt Valley Dome, Grand County, is drilling at 4,050 feet in salt after being down for three days for repairs and alterations to rig.

Diamond Oil Co.'s No. 1, SE NW, Section 16-8s-5e, Utah County, is bottomed at 3,410 feet and running pipe for a water shutoff.

WYOMING

Weston County

Riggs Oil Co.'s No. 1 Fowler, SE cor. NE, Section 16-46-64, which marks a mile extension of the Osage Pool to the west, is still an enigma as to what it will make in the way of production. It topped the Muddy at 3,188 feet and was drilled 6 feet into the sand. It flowed around 130 bbls. per day and then stopped after running for a few days. The best idea of its capacity at present comes from swabbing 70 bbls. per day. The owners expect it to do much better when put on the pump. It has not been deepened or shot.

Egaso Operating Co.'s No. 15, SE cor. NE, Section 17-46-63, on the east side, is drilling at 300 feet, Sandell and others' No. 1, SE SW SE, Section 12-46-64, is drilling at 600 feet. Federal Oil Co.'s No. 1, NE cor. SE, Section 15-46-64, formerly carried as Clark and others, is drilling at 1,400 feet.

Outside of the Osage district, Julius Peters and others' No. 1 Witzell, SE cor. NW, Section 30-46-64, is drilling at 2,275 feet, and the Gose Oil Syndicate's No. 1, NE cor., Section 28-47-63, Soda Creek, is drilling at 4,957 feet after setting pipe at 4,920 feet. Le Faivre Oil Syndicate's No. 1 Martin, NW SE, Section 29-45-68, Buck Creek, has resumed

(Continued on Page 76)

SOUTH TURNER VALLEY WELL DRILLS INTO LIGHT CRUDE PAY

By Victor Lauriston

Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Oct. 17. — Pipe line runs from the Turner Valley Field for September aggregated 66,496 bbls., compared with 66,794 bbls. in August. This represents a net decline of 298 bbls. September was the second complete month under restriction, the total of 66,496 bbls. comparing with 113,429 bbls. in June and 118,614 bbls. in May when wide-open production was close to its peak.

In September, Imperial Oil, Ltd., which limits its producers to 50 per cent of June deliveries, took 14,444 bbls. of crude naphtha, 40,873 bbls. of discolored naphtha and 6,016 bbls. of light crude, a total of 61,333 bbls. Regal Oil & Refining Co., which accepts full production, increased its runs from 4,982 to 5,163 bbls.

The only important new producing well in September was Southern Lowery's No. 3 in Section 9-19-2w5, South Turner Valley, which for part of the month delivered 2,183 bbls. to Imperial Oil, Ltd. The largest individual producer was Mercury Oils' No. 1, with 4,883 bbls. of crude naphtha and 1,721 bbls. of discolored naphtha. Model Oils' No. 1 delivered 5,015 bbls. of crude oil and Southern Lowery's No. 2 delivered 4,045 bbls. of discolored naphtha. Deliveries from East Crest's Nos. 2-A and 3 aggregated 4,953 bbls.

Deducting the new production from Southern Lowery's No. 3, the September figures for the old producers represent a net decline of 2,481 bbls. from August. A substantial quantity of production sold direct to farmers and other consumers does not figure in the pipe line runs, and will considerably increase the actual total production for the month.

Light Crude Producer

In South Turner Valley, Hylo Oils' No. 1, LSD 12, Section 4-19-2w5, drilled into a light crude pay at 4,955 feet. The production apparently comes from the Dalhousie sand. The test was deepened 10 feet with substantial increase in production, accompanied by heavy gas pressure. The well bridged at several points, and at last reports was still being cleaned out, with oil standing about 3,000 feet in the hole and rising steadily. Production will be tested at this depth, but drilling will, if possible, be continued to the Madison limestone. The crude is a greenish colored, high-test product, similar to that encountered at approximately the same horizon in the old Record well on the present Mercury lease. Hylo's No. 1 is about 1,200 feet south of Mercury's No. 1, now the largest individual producer in the field.

In the same general area, Miracle Oils' No. 2, LSD 16, Section 5-19-2w5, is drilling close to the Madison lime at 5,250 feet. Miracle's No. 3, LSD 11, Section 4-19-2w5, is drilling close to the Home sands at 4,473 feet.

Imperial Drilling

In South Turner Valley, Sterling Pacific Oil Co.'s No. 2, LSD 10, Section 33-18-2w5, is making hole below 4,644 feet. This is the last active test of the Imperial string in the Turner Valley Field.

(Continued on Page 71)

Find New Deep Zone in Elwood Field

North Dome Kettleman Hills Well Flows 14,000 Bbls. Initially. State Production Up and May Go Higher During Week

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Oct. 17.—Discovery of a new deep zone in the Elwood Field of Santa Barbara County and the completion of a 14,000-bbl. well in the north dome of Kettleman Hills were of outstanding importance in California during the week. A substantial increase in state production was also of considerable importance, but the new deep zone discovery at Elwood overshadowed all other developments during the week. The significance which attaches to the new discovery at Elwood is not because it might result in development of additional production but rather because it greatly enhances the importance of this field and substantially increases California's ultimate production of crude oil.

The Barnsdall and Rio Grande companies, co-discoverers of the prolific Elwood Field, are likewise credited with the discovery of the new productive horizon. The geological departments of both companies recognized the probable existence of this new zone several months ago but to the industry at large the development of commercial production came somewhat as a surprise. As a matter of fact, it might not be amiss to call attention to the probable existence of one or more additional productive horizons below the new zone proven up a few days ago. This appears more than a probability as the log of the Barnsdall and Rio Grande's No. 1 Bishop-Evans reveals the featheredge of three separate and distinct zones. This deep exploratory well, located outside the proven limits of present production, is undergoing a production test at 6,730 feet, but is not generally expected to result in commercial production due to the thinning out of the oil sand at this point.

The new well is No. 14 Bell Luton, which blew in during a water shut-off test on the 8⅝-inch landed and cemented at 4,325 feet. This hole is bottomed at 4,385 feet and No. 14 Bell Luton is the first well to secure Sespe production within the proven areal limits of Vaqueros production. The Sespe formation, which immediately underlies the Vaqueros, has been productive in Ventura and Santa Barbara Counties for many years. As a matter of record, it is interesting to note that California's earliest wells were finished in the Sespe formation of Ventura County. Up to the present time, however, the Sespe has not yielded the flush production characteristic of the Vaqueros. For this reason, the Barnsdall and Rio Grande's No. 14 Bell Luton, which shows a potentiality of 2,000 bbls. of 40.0 gravity oil per day, opens a new era of development work in the coastal area. The possible significance of this well is quite obvious.

The well was originally finished flowing 4,000 bbls. of clean 38.2 gravity oil per day from the Vaqueros formation at 3,637 feet in January, 1930. It continued on production for a number of months but ultimately went to water due to its structural location, which rendered it susceptible to edgewater encroachment. As a result of the showings encountered in No. 1 Bishop-Evans, the Barnsdall and Rio Grande selected this well as a logical one for a deep test. Considerable difficulty was encountered in cleaning out the hole, but with the removal of all obstacles the bit was carried down to its present depth, 4,392 feet, a short time ago. While being redrilled and deepened to the present zone, this well prematurely blew out a few months ago, indicating the existence of a substantial accumulation of oil and gas.

The Barnsdall is withholding information as to the present status of the well. If additional exploration work proves the existence of another major zone, and all indications point in this direction, operators in this field will have sufficient natural gas to repressure the overlying depleted zone in the Vaqueros. It is reliably reported that Elwood operators are seriously considering the advisability of unifying future development work in order to reduce drilling costs and at the same time effect maximum recovery of crude oil and natural gas. Drilling operations in the Elwood Field have been practically nil during the past year and no change is expected in the present status of work. It appears probable that the Barnsdall and Rio Grande will suspend production activities on No. 14 Bell Luton within a short time in order that this new virgin zone may be held as a reserve until conditions improve or a better price prevails for crude and refined oils. Adoption of such a policy will preclude the drilling of additional wells and retard exploitation of the new Sespe zone.

Kettleman Hills

The Superior Oil Co. successfully finished its third big well in the north dome of Kettleman Hills during the past week when No. 3 Huffman came in under a natural flow doing 14,000 bbls. of clean 35.4 gravity oil and 6,150,000 feet of natural gas per day from 8,490 feet. This new well has a penetration of 1,444 feet in the Temblor, the water string having been landed and cemented at 7,046 feet. Inside the 9⅝-inch water string a 6⅝-inch flow string was hung at 6,743 feet and the well completed flowing through two 1 13/32-inch beans under a pressure of 1,380 pounds. The Superior subsequently pinched in this well to approximately 9,000 bbls. and may ultimately effect a further curtailment, although the future policy of the company is not known at present. As a matter of fact, the Superior's decision to complete this well came somewhat as a surprise as this company, in conjunction with other operators at Kettleman Hills, accepted a pegged allowable which was to prevail until January 1, 1932. Those interested in conservation work are somewhat perturbed because of the possibility that this well may upset curtailment work at Kettleman Hills unless drastic action is undertaken.

Drilling operations have been kept well under control in the north dome at Kettleman Hills during the past year and will undoubtedly be kept down to a minimum for some time to come. The Kettleman North Dome Association recently spudded in No. 76-34Q in Section 34-22-18 and the Standard is building rig for No. 25-23 Q, a new well to be started in Section 23-22-18. With these two exceptions, however, no new development has been undertaken for several months. The Standard has been experiencing considerable difficulty in No. 65-29 J and this well is still in bad mechanical shape and an early completion is questionable. The company has been working on this well for several months and is loath to suspend work as it is a direct offset to the Superior's No. 2 Huffman, which came in a few days ago flowing at the rate of 14,000 bbls. per day. The Superior completed No. 3 Huffman in five months' drilling time, thus indicating, presumably, the advantages of using an oversize derrick. The rig used in the drilling of No. 3 Huffman has an A.P.I. rating of 174 feet with a 32-foot base and permits the pulling of 132 feet of drill pipe in one operation. This equipment is particularly suitable to deep drilling and the advantage increases with depth.

Dominguez

The Union Oil Co. recompleted its No. 4 Carson in the Dominguez Field early in the week and this rejuvenated well was returned to production flowing 2,250 bbls. of exceptionally clean 31.6 gravity oil per day from the third Callender zone. This well was bottomed at 4,766 feet and finished with an 8⅝-inch water string landed and cemented at 4,609 feet and a 4½-inch liner including 156 feet of perforated. The substantial production shown by No. 4 Carson is indicative of the tremendous reserve held in this field as the well is producing from only 150 feet of formation. The Union is drilling three other wells in this area which should be tanking oil within 30 days, unless drilling can be retarded. No. 26 Callender, one of this trio of potential producers, blew in early in the month flowing 40,000,000 feet of gas per day but the flow was killed as this premature flow was made during a water shut-off test. Drilling operations of the Union are made necessary because of lease requirements and not because of any intention of the company to develop additional production. This development work has made it necessary for the Shell to institute offset drilling but future operations will be free of any competitive development. The Shell has one well, No. 40 Reyes, already under way and has started rig construction for another, No. 41, on the same lease.

Huntington Beach

The Huntington Beach town lot area is still an enigma so far as deep zone production is concerned, notwithstanding the production test now being made on W. E. McCaslin's No. 17 Transport bottomed in the deep zone at 8,365 feet. This well flowed by heads for a short time at the rate of 200 bbls. per day but there was not sufficient kick to result in a steady sustained flow. In addition to this unfavorable factor, the production was cutting approximately 25 per cent and the amount of water in the fluid appeared to increase with additional swabbing. Its exact status is somewhat shrouded in mystery. This is especially interesting because of the report that the perforations in this well are located around the 4,500-foot level, which, if true, would explain the failure of the well to result in a natural flow.

The Superior Oil Co., which focused the attention of operators on the new possible deep zone in this area more than a year ago, is drilling No. 1 Eberle at 8,325 feet, the prevailing formation being a hard sandy shale. This well is being carried down as a deep test, although it will by no means condemn the entire area if commercial production is not secured. No 1 fee, the Superior's initial deep test in this field, is standing shut in at 7,648 feet under an accumulated pressure of 400 pounds. Until this well is opened, the possible deep sand at Huntington Beach will continue to be of debatable importance. No. 2-7 Gillette of the Superior is likewise suspended, although this project, bottomed at 8,265 feet, did not show any encouragement. The Vaqueros Major Oil Co. has assembled material to be used in the construction of a drilling pier in the northern end of the Huntington Beach town lot area and construction work is expected to get under way shortly.

State Production

State production of crude oil, reflecting current completions, registered a substantial increase during the week and may go higher next week, depending upon the policy pursued by the Superior Oil Co. at Kettleman Hills. Production will probably be also aggravated by additional completions in the Dominguez Field and spasmodic completions in other areas. State production late this week averaged 515,000 bbls. per day, although of course the average production for the week will be substantially below this figure. Crude oil production has shown a consistent increase during the past three weeks, rising from 490,750 bbls. on October 3 to 505,000 bbls. on October 10 and 515,000 bbls. on October 15. This increasing tendency is of particular importance in view of the approaching winter season with its lessoned demand for refined products. There is a possibility, however, that the demand for fuel oil may be slightly higher than usual but this depends to a large extent upon the amount of natural gas available for commercial consumption. If the state is successful in its attempt to prevent the waste of natural gas by applying a gas-oil ratio in flush-fields, there may possibly be a tempo-

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	.....	65,690
Fuel oil	.....	.....	.....	.....	.....	71,950
Diesel and gas oil	.....	.....	.....	.....	1,379,888	2,670,353
Gasoline	247,746	35,392	230,850	32,977	11,039,304	15,603,401
Kerosene	.....	.....	.....	.....	187,934	.....
Coastwise—						
Crude oil	268,057	38,295	341,881	48,840	17,436,449	12,418,733
Fuel oil	389,376	55,625	390,657	55,665	10,382,415	13,984,970
Diesel and gas oil	71,095	10,014	17,784	2,541	1,229,410	1,295,614
Gasoline	336,701	48,100	222,468	31,771	11,044,355	10,035,771
Kerosene	5,855	836	5,006	715	246,268	149,266
Naphtha distillate	.....	.....	.....	.....	4,952	.....
Exports—						
Crude oil	76,893	10,985	91,564	13,081	5,864,849	5,385,082
Fuel oil	136,561	19,509	235,517	33,645	10,571,895	14,194,922
Diesel and gas oil	13,092	1,870	28,130	4,019	2,858,984	3,580,321
Gasoline	143,111	20,444	337,567	48,224	6,966,227	12,895,597
Kerosene	.....	.....	39,730	12,819	1,321,179	3,034,034
Lubricants	.....	.....	.....	.....	36,353	27,434

TANKER SHIPMENTS, SAN FRANCISCO TO ATLANTIC AND GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	.....	279,088
Gasoline	.....	.....	151,760	21,680	833,929	1,008,757
Lubricants	.....	.....	.....	.....	35,236	24,774
Coastwise—						
Fuel oil	62,590	8,941	4,996	714	2,750,932	2,664,967
Diesel and gas oil	.....	.....	.....	.....	346,660	275,766
Gasoline	132,948	18,993	31,127	4,447	3,508,961	3,401,114
Kerosene	4,740	677	.....	.....	255,281	179,426
Naphtha distillate	.....	.....	.....	.....	49,780	.....
Exports—						
Crude oil	20,511	2,930	.....	.....	269,592	59,993
Fuel oil	.....	.....	.....	.....	1,285,726	809,316
Diesel and gas oil	47,410	6,773	.....	.....	482,708	457,589
Gasoline	163,791	23,399	77,600	11,086	3,613,965	3,316,299
Kerosene	.....	.....	.....	.....	688,272	548,658
Lubricants	.....	.....	.....	.....	25,693	33,579

rary shortage during January, 1932, the peak month. If commercial establishments and generating plants are taken off natural gas this will result in an increased demand for fuel oil or refinery residuum during the carry-over period. Industrial users in both the San Francisco Bay region and in Southern California are rated after domestic users and, since they are liable to be cut off on short notice, have stand-by units which operate on fuel oil.

Playa Del Rey

Drilling operations in the Playa Del Rey Field, which have been at a low ebb for several months, were reduced still further this week by the completion of the Ohio Oil Co.'s No. 11 Recreation. This new well, bottomed at 5,755 feet, was brought in doing 330 bbls. of 23.4 gravity oil per day, the hole having been finished with an 8⅝-inch water string cemented at 5,402 feet and a 5½-inch liner carrying 339 feet of perforated. The Herndon Petroleum Co.'s No. 3 Venice, completed two weeks ago, is holding up fairly good, current production approximating 355 bbls. per day. York & Smullin focused the attention of operators on the Potrero town lot area early this week by coring a new deep zone in No. 1 Blinn at 6,510 feet. This well is standing cemented but is expected to be given an early production test. The Taylor Oil Co. has recemented No. 8 Rawco in this area at 6,310 feet and a good producer is expected if a satisfactory water shutoff can be effected. In the Long Beach Field, the Chiksan Oil Co. completed No. 2 Wolter pumping 90 bbls. of 25.9 gravity oil per day from 5,452 feet. The Ring Oil Co.'s No. 18 Cerritos proved a distinct disappointment upon recompletion at 8,248 feet as it was good for only 490 bbls. of 29.2 gravity oil per day. This well, finished with a 3-inch liner carrying 395 feet of perforated, came in several weeks ago flowing 1,800 bbls. per day on a water shut-off test at 8,053 feet, but for some reason showed a loss in production upon being deepened. The Standard spudded in two new wells on the Murphy Coyote property in the West Coyote Field early this week and is rigging up No. 110, a new well, for early work.

Lost Hills-Belridge

There were no favorable developments in the Lost Hills-Belridge Fields of Kern County during the week and the outlook does not look especially promising. As a matter of fact, drilling operations in these fields were somewhat discouraging, although not conclusive by any means. In the Lost Hills area the Lincoln Petroleum Co. has started preparations to recement No. 1-A Theta in Section 12-26-30. This deep test, bottomed at 5,328 feet, was cleaned out to 5,280 feet and then swabbed to 4,600 feet. The high pressure salt water is apparently shut off, although some fresh water is still entering the hole and prevented a successful production test. After cleaning out a bridge at 5,240 feet, the company circulated oil and shut the well in for a period of three hours. During this period pressure built up to 1,300 pounds but became dissipated within a short time after the well was opened up and flowed for a short time by heads. The General Petroleum is still held up with mechanical trouble in its No. 1,301 in this area at 4,399 feet. In the Belridge Field, the General Petroleum is nearing the 7,000-foot level in No. 1 Berry, in Section 30-28-21. The Belridge Oil Co.'s deep test, No. 64 in Section 27-27-20, has not enhanced the outlook for deeper production in the North Belridge Field as this hole is already down below the 6,500-foot level.

The Republic Petroleum is rigging up rotary equipment for No. 25-A, which is scheduled to be a deep test in Section 8-32-23, in which section of the Midway-Sunset Field the company proved up a productive zone unknown previous to the Republic's exploration work a few years ago. There is very little drilling under way in either the Mount Poso or Round Mountain Fields of Kern County, due to curtailment, and there is every reason to believe future operations will be restricted. Osborn-Colter are making preparations to conclude a pumping test on No. 2 Shell-Duff in the Weed Patch area of Kern County and the outlook is considered favorable for small production from the 1,952-foot level. The Weed Patch, or Mountain View Field of Kern County, was discovered by the Shell Oil Co. more than a year ago, but due to limited development has not yet produced any commercial oil. It is believed probable the Shell will undertake additional exploration work in this district soon after the first of the year. The Dudley Ridge area is scheduled to be the scene of additional exploration work during the next several months, due to the possibility of developing commercial gas production in this section. The limited amount of drilling undertaken up to the present time indicates presence of a commercial gas zone, although its extent and productivity is still conjectural.

Ventura County

The Bardeen Petroleum Co. completed No. 1-B Lankershim, a new well in the Hopper Canyon section of Ventura County, pumping 131 bbls. of exceptionally clean 29.6 gravity oil per day from 1,799 feet. In the San Miguelito district, approximately midway between the Rincon and Ventura Avenue Fields, the Continental Oil Co. is making preparations to recement No. 1 Grubb, which blew in a few weeks ago flowing at the rate of 1,000 bbls. per day during a water shut-off test on the 9⅝-inch landed at 6,472 feet. The Magu Syndicate's No. 1 Utt, a wildcat in the Oxnard section of Ventura County, has just passed the 5,100-foot level without encountering anything resembling production and the outlook is considered discouraging. Drilling operations in the Ventura Avenue Field have reached the lowest level since aggressive development work was started in this area several years ago and indications point to a still further decline during the next several months.

SOUTHWEST TEXAS FIELDS

(Continued from Page 43)

the field by drilling a second producer to the west. Now they are starting another test 150 feet west and 330 feet north of the discovery well.

Goliad County

Other new locations include Plymouth Oil Co.'s No. 1 Parks, in Goliad County, northeast of the city of Goliad, which is building a derrick. Gibson Oil Corp. of Amarillo, Tex., drilled a test on the Parks ranch and went a mile deep and got some showings but heaving formations prevented a conclusive test. This new test is southwest of the shallow gas in northern Victoria County found by the Humble Oil & Refining Co., the direction from the Humble block of leases being about parallel with the outcrop of the formations and the coast line and about 20 miles southwest of the Humble block. Humble drilled a deep test a year or more ago on its block.

This week should tell the tale on Camp and Stanolind's No. 2 Pettus in Goliad County, 15 miles northeast of the Pettus Field in Bee County. No. 1 is a small oil and gas well at around 4,000 feet, in the Pettus sand. No. 2, late in the week, was below 3,700 feet. No. 1 made about 15 bbls. of oil and was carried as Neuhaus and Stanolind's No. 1 Pettus.

In Guadalupe County, Camp's No. 1 Dan Denman topped the chalk at 2,256 feet compared with 2,145 feet in Humble's No. 1-C Sue Denman. The test is several locations southwest of Camp's No. 1 Sue Denman which had a thin slice of chalk just about the Edwards at 2,507 feet. Camp's No. 1 Sue Denman came in for an initial of around 8,000 bbls. a day and gauged through choke over 6,000 bbls. No. 1 Dan Denman has a chance of also cutting the fault.

SUPREME COURT SUSTAINS BAN ON PROSPECTING

WASHINGTON, D. C., Oct. 19.—Reconsideration of its decision upholding Secretary Wilbur's action prohibiting further prospecting for oil and gas was refused by the Supreme Court. The Wilbur order was issued to carry out the oil conservation policy announced by President Hoover in March, 1929.

Roy G. Barton, applicant for a permit to prospect for oil and gas on public lands near Las Cruces, N. Mex., and several others attacked the withdrawals but lost.

In asking a review of the decision, Barton charged that Wilbur was insincere in enforcing his order. He said 482 oil and gas prospecting permits had been issued by the department of the interior since the poilcy was announced. Several western states joined in assailing the order before the Supreme Court but they did not participate in the request for a rehearing.

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S	T	R	Depth	Status
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9-	2-	15	7,350	fishing
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12-	2-	15	6,238	suspended
Westwood Oil Co., No. 2 Hermosa, Los Angeles Co.	6-	4-	14	2,151	suspended
Baxter Pet., No. 1 Hermosa, Los Angeles Co.	5-	4-	14	rig	suspended
Staple Oil Co., No. 1 Manhattan, Los Angeles Co.	24-	3-	15	2,700	suspended
Pacific Shore Oil Co., No. 1 Lawndale, Los Angeles Co.	20-	3-	14	rig	suspended
Smith, J. O., No. 1 Lawndale, Los Angeles Co.	20-	3-	14	rig	suspended
Wilmington Consd., No. 1 Watson, Los Angeles Co.	17-	4-	13	1,012	suspended
Ranger Pet. Co., No. 1 Watson, Los Angeles Co.	28-	4-	13	rig	rigging up
Pedro Pet. Corp., No. 1 San Pedro, Los Angeles Co.	14-	5-	14	rig	suspended
Brubaker, W. O., No. 1 Van Nuys, Los Angeles Co.	11-	2-	15	2,700	suspended
Rucker & Croul, No. 2 Puente, Los Angeles Co	27-	2-	10	2,200	suspended
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	20-	2-	9	2,110	suspended
Cudahy Oil Co., No. 1 Bell, Los Angeles Co.	30-	2-	12	1,370	suspended
Jones, W. L., No. 1 Bell, Los Angeles Co.	31-	2-	12	rig	suspended
Weist Oil Co., No. 1 Montebello, Los Angeles Co.	34-	1-	11	4,975	gr. sd. drilling
Blinn & Gray, No. 1 Montebello, Los Angeles Co.	6-	2-	11	4,902	suspended
Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co.	34-	1-	13	3,919	suspended
Yellowstone Oil Co., No. 2 Alhambra, Los Angeles Co.	19-	1-	12	2,015	suspended
Rucker, L. W., No. 1 Calabasas, Los Angeles Co.	26-	1-	17	1,004	br. sh. drilling
Caballero Estates, No. 1 Calabasas, Los Angeles Co.	23-	1-	16	1,260	cemented
Olympic Corp., No. 1 Calabasas, Los Angeles Co.	18-	1-	17	5,960	suspended
Simi Oil Co., No. 1 Calabasas, Los Angeles Co.	18-	1-	17	2,550	sd. sh. drilling
Marble, Willard, No. 1 Chatsworth, Los Angeles Co.	6-	2-	16	502	hd. sd. drilling
Superior Oil Co., No. 1 Newport, Orange Co.	27-	6-	10	2,714	sd. sh. drilling
Ajax Pet., No. 1 Newport, Orange Co.	21-	6-	10	5,495	hd. sd. drilling
Beck, Alfred, No. 1 Corona, Riverside Co.	8-	4-	6	1,110	suspended
Alberta Oil Co., No. 1 Elsinor, Riverside Co.	35-	2-	2	3,475	suspended
Duncan, N. L., No. 1 Sagebrush, Riverside Co.	8-	4-	6	1,157	suspended
Colan Dev. Co., No. 1 Redlands, San Bernardino Co.	25-	1-	2	2,392	redrilling
Mason Oil Co., No. 1 Salton Sea, Imperial Co.	1-	17-	15	610	sd. sh. drilling
Borderland Oil Co., No. 1 Encinitas, San Diego Co.	12-	13-	4	2,519	suspended
Borderland Oil Co., No. 1 Point Loma, San Diego Co.	30-	16-	3	5,124	will test
South Bay Oil Co., No. 1 Border, San Diego Co.	31-	18-	2	1,243	suspended
Itasca Pet. Co., No. 1 Mesa, San Diego Co.	33-	18-	1	1,570	fishing
Carr, O. K., No. 1 Capistrano, San Diego Co.	13-	6-	8	5,250	suspended
Oklahoma Oil Corp., No. 1 Palms, San Diego Co.	25-	11-	8	510	redrilling

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S	T	R	Depth	Status
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5-	9-	35	7,695	br. sh. drilling
Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2-	7-	35	3,450	suspended
Ohio Oil Co., No. 1 Goleta, Santa Barbara Co.	16-	4-	28	4,802	br. sh. drilling
General Pet., No. 1 Goleta, Santa Barbara Co.	21-	4-	28	4,533	gas, shut in
General Pet., No. 2 Goleta, Santa Barbara Co.	21-	4-	28	4,350	gas, shut in
General Pet., No. 3 Goleta, Santa Barbara Co.	21-	4-	28	6,912	testing
General Pet., No. 133 Goleta, Santa Barbara Co.	21-	4-	28	2,030	suspended
General Pet., No. 134 Goleta, Santa Barbara Co.	21-	4-	28	2,053	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21-	4-	28	2,047	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21-	4-	28	2,050	suspended
General Pet., No. 138 Goleta, Santa Barbara Co.	21-	4-	28	4,931	suspended
General Pet., No. 139 Goleta, Santa Barbara Co.	21-	4-	28	2,051	suspended
Bowles Oil Co., No. 140 Goleta, Santa Barbara Co.	21-	4-	28	2,065	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20-	4-	28	2,004	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20-	4-	28	2,012	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20-	4-	28	2,010	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22-	4-	28	2,010	suspended
Bellview Oil Co., No. 159 Goleta, Santa Barbara Co.	24-	4-	29	2,099	suspended
Cochran, J. H., No. 1 Naples, Santa Barbara Co.	7-	4-	29	5,134	suspended
Strickland & Tippett, No. 1-A Goleta, Santa Barbara Co.	19-	4-	27	4,880	sd. sh. drilling
Sovereign Oil Co., No. 1 Guadalupe, Santa Barbara Co.	20-	10-	35	5,500	suspended
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14-	5-	27	2,345	suspended
Associated, No. 1 Rincon Creek, Ventura Co.	19-	4-	28	2,080	suspended
Continental, No. 1 Rincon, Ventura Co.	23-	3-	24	6,640	recemented
Bell, H. H., No. 1 South Mountain, Ventura Co.	22-	3-	21	901	sd. sh. drilling
Pure Oil Co., No. 1 S. F. Canyon, Ventura Co.	15-	4-	21	2,591	suspended
San Pedro Oil Co., No. 2 Sespe, Ventura Co.	13-	4-	21	3,575	hd. sd. drilling
Magu Synd., No. 1 Oxnard, Ventura Co.	17-	1-	21	5,100	hd. sd. drilling
Mex Cal Oil Co., No. 1 Conejo, Ventura Co.	12-	1-	20	240	suspended
Graham & Loftus, No. 1 Goose Lake, Kern Co.	20-	27-	22	3,501	sd. sh. drilling
Wilshire Oil Co., No. 1-A Buttonwillow, Kern Co.	7-	29-	24	7,000	suspended
Milham Expl. Co., No. 6 Buttonwillow, Kern Co.	8-	28-	23	3,455	to set pipe
Calif. Oil Producers, No. 2 McKittrick, Kern Co.	30-	30-	22	6,660	to abandon
Purman, T. H., No. 1 McKittrick, Kern Co.	22-	29-	21	501	suspended
Federal Drlg. Co., No. 1 Buena Vista, Kern Co.	20-	31-	24	5,367	suspended
General Pet., No. 1 Belridge, Kern Co.	30-	28-	21	7,000	br. sh. drilling
Wallace, K. C., No. 1 Belridge, Kern Co.	32-	29-	21	4,222	suspended
Rio Cal Pet., No. 1 Shale, Kern Co.	2-	27-	18	2,355	suspended
Wicker, Sy., No. 1 Arvin, Kern Co.	12-	30-	28	3,803	suspended
Shell, No. 1 Weed Patch, Kern Co.	29-	30-	29	5,910	suspended
Osborn, Colter, No. 1 Weed Patch, Kern Co.	15-	30-	29	3,465	suspended
Osborn, Colter, No. 2 Weed Patch, Kern Co.	15-	30-	29	2,000	testing
Mohawk Oil Co., No. 1 Weed Patch, Kern Co.	32-	30-	29	6,150	suspended
Standard, No. 1 Devils Den, Kern Co.	14-	25-	18	1,600	suspended
Cumberland Oil Co., No. 2 Devils Den, Kern Co.	21-	26-	18	2,775	br. sh. drilling
Signal Oil Co., No. 1 Blackwell Corner, Kern Co.	15-	26-	19	106	tech. spud
United Kern Pet., No. 1 Mojave, Kern Co.	26-	10-	14	1,065	suspended
Meridian Oil Co., No. 1 Mojave, Kern Co.	11-	9-	15	3,875	hd. sd. drilling
Kendall Dev. Co., No. 1 Mojave, Kern Co.	27-	11-	9	764	hd. sd. drilling
Harding, J. B., No. 1 Mojave, Kern Co.	5-	10-	10	1,030	redrilling
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-	11-	19	6,025	suspended
Associated, No. 1 Jacalitos, Fresno Co.	22-	21-	15	6,197	suspended
Panorama Oil Co., No. 1 Carrizo, San Luis Obispo Co.	7-	31-	21	4,019	suspended
Kent & McDonald, No. 1 Carrizo, San Luis Obispo Co.	3-	32-	22	2,150	br. sh. drilling
Trav-El Oil Co., No. 1 Carrizo, San Luis Obispo Co.	7-	32-	22	2,450	cleaning out
Paso Robles Synd., No. 1 Paso Robles, San Luis Obispo Co.	34-	27-	11	4,040	suspended
Cent. Coast Inv. Co., No. 1 Atascadero, S. Luis Obispo Co.	1-	28-	12	411	sd. sh. drilling
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	24-	28-	12	1,475	suspended
Pacific Inland, well No. 1, Monterey Co.	19-	23-	15	1,345	sidetracking
Brown, W. F., No. 1 Parkfield, Monterey Co.	15-	23-	14	1,051	suspended
Guess, W. G., No. 1 Monocline, King Co.	7-	21-	21	4,620	resume work
Lacal Gas Co., No. 1 Dudley Ridge, King Co.	32-	22-	20	rig	suspended
Irma Investment Co., No. 1 Dudley Ridge, Kings Co.	7-	23-	20	1,345	gas well, idle
O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co.	7-	23-	20	1,635	gas well, idle
Eagle Oil Co., No. 1 Dudley Ridge, Kings Co.	15-	23-	20	rig	suspended
Kettleman Lakeview, No. 1-A Dudley Ridge, Kings Co.	20-	23-	20	1,095	testing
Valley Expl. Co., No. 1 Dudley Ridge, Kings Co.	12-	23-	19	1,287	resume work
Valley Expl. Co., No. 2 Dudley Ridge, Kings Co.	12-	23-	19	416	sd. drilling
Knudsen & Schmidt, No. 1 Reef Ridge, Kings Co.	36-	23-	17	4,315	recemented
Seymour, L. W., No. 1 Avenal, Kings Co.	10-	23-	16	1,148	suspended
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-	12-	17	7,635	hd. sd. drilling
Orinda Pet., well No. 1, Contra Costa Co.	32-	1-	3	2,120	suspended
Tulaco Oil Co., No. 1 Corcoran, Tulare Co.	17-	22-	22	....	location
Ducor Pet. Co., No. 1 Ducor, Tulare Co.	14-	24-	27	2,200	suspended
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-	17-	24	2,092	suspended
Ellis & Stanford, No. 1 Tulare Lake, Tulare Co.	20-	24-	23	1,610	sd. sh. drilling
Colusa Oil Co., No. 1 Bush, Colusa Co.	31-	15-	4	965	hd. sd. drilling
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3-	2-	10	4,202	hd. sd. drilling
Orland Oil Synd., No. 1 Orland, Tehama Co.	31-	23-	3	3,040	suspended

SUPERIOR PERFORMANCE

. . . is True Economy

Operators, contractors and drillers throughout the Rotary fields of the world can testify to the fast, safe and economical performance of Hughes Rock Bits and Cones.

"Sold by Supply Stores Everywhere"

HUGHES TOOL COMPANY

Service Plants:
Los Angeles, Calif.
Oklahoma City, Okla.
Midland, Texas

Main Office and Plant:
HOUSTON
TEXAS

Export Offices:
Woolworth Bldg.
New York City

Personal Paragraphs About Oil Men

S. K. Williamson of San Antonio, Tex., has moved to Purvis, Miss.

* * *

L. C. Harbert, sales manager, J. P. Ratigan, Los Angeles, Calif., visited Tulsa last week.

* * *

S. P. Davies, of the Bethlehem Steel Company, Dallas, Tex., has returned from a business trip to Mexico.

* * *

C. A. Brinckmann, sales representative of the National Ammonia Company, Inc., St. Louis, was in Tulsa last week.

* * *

W. R. Pennington, a representative of James B. Berry Sons' Company, Inc., Oil City, Pa., was in Tulsa last week.

* * *

R. W. Bier, manager of the Union Pump Company of Houston, Tex., was a business visitor in Dallas, Tex., last week.

* * *

W. C. Ray, geologist of San Antonio, Tex., for many years with the Prairie and Empire Companies, has lately been in San Antonio.

* * *

Allen Whiteside, of the Sinclair Consolidated Oil Corporation, is confined to his home following a minor operation in a Tulsa hospital.

* * *

O. D. Small, New York City, export manager of The Texas Company, stopped off in Houston, Tex., en route to Mexico on an inspection trip.

* * *

M. B. Crone, manager of the Key Boiler & Equipment Company, East St. Louis, Ill., has been in Texas transacting business during the past week.

* * *

R. H. Hargroves, vice president of the United Gas Company, Houston, Tex., accompanied by Mrs. Hargroves, is in New York City for a several weeks' visit.

* * *

Roy Lehman, geologist for the Sinclair Consolidated Oil Company, has established headquarters at Greeley, Colo., where he will remain during the winter.

* * *

Mr. and Mrs. Alfred G. Heggem have returned from a trip to Denver, Colo., and Fremont, Neb., where they visited Mr. Heggem's cousins, Mr. and Mrs. Dan Stephens.

* * *

F. D. Hooper has been appointed general sales manager of the Barber-Greene Company, Aurora, Ill. Prior to this appointment, Mr. Hooper was sales manager of the Lidgerwood Manufacturing Company.

* * *

Coe F. Dix, chief engineer for the Oklahoma Pipe Line Company at its Council Hill, Okla., station, and family, have returned from a vacation trip in Texas, having visited Dallas, Waco, Temple, Austin, San Antonio and Nuevo Laredo, Mexico.

* * *

J. A. Vickers, president of Vickers Petroleum Company, Wichita, Kans., is improving after a serious illness and expects to leave the hospital within a few days. He expects to leave for California for the winter with his family as soon as he is able to travel.

* * *

George E. Totten has been appointed manager of sales of the tin plate division of Republic Steel Corporation with headquarters in the general offices of the corporation in Youngstown, Ohio, according to an announcement by N. J. Clarke, vice president in charge of sales.

* * *

C. J. Reeves, 10 years with Keen & Wolff Oil Company and Deepwater Refineries, Inc., both of Houston, Tex., has joined the sales force of the Crown Central Petroleum Corporation with refinery at Houston. Mr. Reeves will maintain headquarters at Dallas and will represent Crown Central in Texas, Oklahoma, Louisiana and Arkansas.

R. A. Graddy of Bell & Graddy, Inc., geologists, of Dallas, Tex., has lately been in Southwest Texas.

* * *

H. H. Goodenough, engineer of the Refinery Supply Company, Tulsa, has gone to Texas points on business.

* * *

F. G. Delaney of Los Angeles, Calif., has lately been spending some time in San Antonio and Southwest Texas.

* * *

Carl Metcalf arrived in Petrolia, Ontario, recently on furlough from Talara, Peru, where he has spent some years with the International Petroleum Company.

* * *

Dr. Gustav Egloff, of Universal Oil Products Company, Chicago, addressed the New England section of the American Chemical Society, at the Academy of Arts and Sciences, Boston, October 9. His subject was "Modern Motor Fuel."

Men of the Industry

Fred Smith

Entrance of Fred Smith, division superintendent of the Gypsy Oil Company, into the oil business came about through chance. He was on his way from Peru, Kans., to his home in Butler, Bates County, Kansas, when a conversation with a stranger in a hotel lobby in Independence, Kans., resulted in his taking a job as a roustabout on a well being drilled near Peru. That was about 31 years ago, and Mr. Smith was little more than a boy at the time.

The young roustabout in 1903 was transferred to the Glenn Pool district, and here four years later he began working as a pumper. The next year he was promoted to foreman and from that point advancement was steady. In 1921 he was made a division superintendent for the Gypsy and in that capacity he has served in virtually every important Mid-Continent Field except Seminole. At present he is in charge of production in northern Oklahoma and southern Kansas.

With 18 strings of tools going at once back in the flush period of Glenn Pool there were times when for eight to ten days at a stretch the only sleep Fred Smith got was "cat naps" on the lazy bench. Later in northern Oklahoma he had 128 drilling wells under his supervision at one time. His hobby is his garden in the rear of his home in East Twenty-seventh Street, Tulsa. He plays golf on the Indian Hills course near that city.

Rufus G. Smith of San Antonio, Tex., has lately been on an extended trip to New York.

* * *

M. E. Gray, of the Jenkins Process Corporation, Chicago, Ill., was in Texas during the week on business.

* * *

Harry Wood, of Lexington, Ky., prominent operator in the Kentucky fields, is visiting at his old home in Bradford, Pa.

* * *

Walter F. Vogel, of the San Antonio Machine & Supply Company, San Antonio, Tex., called on oil company trade in Tulsa.

* * *

Wallace E. Pratt, director of the Humble Oil & Refining Company, Houston, Tex., has returned from a short trip to California.

* * *

George A. Dornbush, of the St. Louis office of the Jones & Laughlin Steel Corporation, was in Tulsa for a few days last week.

* * *

Bob Turner, of the Ross Heater & Manufacturing Company, Houston, Tex., spent the week in the northern end of the State on business.

* * *

William H. Gray, Tulsa, president of the National Association of Independent Oil Producers, is seriously ill with pneumonia at a Tulsa hospital.

* * *

W. Harold Mara, former president of the Toronto Stock Exchange, has been elected to the directorate of the Petrol Oil & Gas Company of Toronto.

* * *

H. S. Strouse has been appointed treasurer of the Harnischfeger Corporation, Milwaukee, Wis., being succeeded as advertising manager by J. O. Ferch.

* * *

Charles E. Orchard, Wyoming and Montana oil operator, has returned to his office in Denver, Colo., after a trip to his ranch property in northern Wyoming.

* * *

George F. Prussing, safety director of the Union Oil Company of California, stopped off in Dallas, Tex., on his way to Chicago to attend the National Safety Council meeting.

* * *

Adolph Dovre, geologist for the Tidal Oil Company, in Southwest Texas, but for the past several months working in East Texas, has been transferred by the company back to San Antonio.

* * *

A. E. Crockett, Jones & Laughlin Steel Corporation, Pittsburgh, Pa., who addressed a meeting of Tulsa Association left for Chicago where he is to make a talk before an engineers club in that city.

* * *

George W. Bovaird, of Bradford, Pa., oil producer and equipment manufacturer, is in Philadelphia, Pa., this week as delegate from his lodge to the two hundredth anniversary of the Grand Lodge of Pennsylvania, Free and Accepted Masons.

* * *

Thor Warner, consulting geologist, who 10 years ago made his residence in San Antonio, Tex., but for several years has been in Los Angeles, Calif., is back at San Antonio to do a couple of months work in Southwest Texas and will then return to Los Angeles.

* * *

J. Herbert Canning, O.B.E., president of the Institution of Gas Engineers, London, England, and Hideo Morioka, chief engineer of the Nishi Works, Kobe Gas Company, Japan, attended the annual convention of the American Gas Association at Atlantic City, N. J.

* * *

Eugene Coste, for many years president of the Canadian Western Natural Gas, Light, Heat & Power Company of Calgary and now a resident of Toronto, has purchased Missisquoi, the summer home of the late Sir Edward Kemp on Pigeon Lake, near Bobcaygeon, Ontario.

Expect Better Demand for Lima Crude

Six Completions in Central Ohio, but None Oil Producer. Survey of Tests in Indiana. Operations in Kentucky and Michigan Fields

By George A. Whitney
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Oct. 19.—With the Solar Refining Co., Lima, Ohio, expecting to use 1,000 bbls. of Lima crude daily during the next 60 days, Lima crude producers as well as those over the old Trenton Rock producing regions believe a favorable turn has come in the crude oil situation in northwestern Ohio. Difficulty has been encountered in marketing Lima crude in the last year, piling up in storage.

Three completions were reported from the Lima Field. In Ottawa County, Emery Qualman drilled a shallow test on the Qualman farm, near Port Clinton in the eastern part of Ottawa County, and found a gas well with a rock pressure of 50 pounds at a depth of 400 feet. This may bring about a hunt for gas by some of the large farmers in that part of the county, who will welcome the gas to their homes during the winter months. The well was drilled for water, but came in gas.

Wiser Oil Co.'s No. 5, on the Grant Geiger No. 1 farm, Section 12, Cessna Township, Hardin County, is said to show for a 3-bbl. pumper along with 55,000 feet of gas from the Trenton lime from 1,365-77 feet. Same company is drilling No. 1 on the Grant Geiger No. 2 farm, Section 13, same township. Kurtz Gas Co.'s No. 1 William F. Kurtz farm, Section 20, Jackson Township, same county, failed to find either oil or gas and goes as a dry hole at a depth of 1,360 feet.

In Wyandot County, Tymochtee Township, Temple and Kennedy are drilling No. 1 on the Flaxenhead farm, and O'Neil and others are drilling No. 1 Jacob Fruth farm, Section 7, same township. O'Neil and others are also drilling on the John Neiderkoker farm, Section 1, Crawford Township, same county. Cook, McPherson and Miller are drilling No. 1 Bowman-Brillhart farm, Section 21, Tymochtee Township, Wyandot County.

Lake Shore Oil & Gas Co. found a fair gas volume on the Robert S. Patterson farm, Section 6, Washington Township, Logan County, at a shallow depth from 760-67 feet.

Peninsula Oil Co.'s No. 11 well which is on the J. P. Caughney lots, in Catawba Township, Ottawa County, is estimated as a 3-bbl. pumper.

The Tiffin Industrial Gas Co., of Tiffin, Ohio, announced completion of negotiations for the sale of natural gas from the 1,000,000-foot producer in the McCutchenville Field in Wyandot County, to the Ohio Fuel Gas Co. The announcement is believed to mark the early resumption of gas purchasing in the field, discontinued by the Ohio Fuel last spring.

Recovery Oil & Gas Co. is drilling on the J. A. and H. G. Haines farm, Section 31, Seneca Township, Seneca County.

CENTRAL OHIO

Only 6 completions were reported from the Central Ohio Field, there being 1 dry hole, 5 gas wells and no oil producers. There were 6 locations for new wells made and 14 wells started spudding, a total of 20 in new work. There were 3 wells brought in in Meigs County, all being gas producers.

In Ashland County, the Ohio Fuel Gas Co. has a gas well in No. 2-5541 Amos and William Weisman farm, Section 1, Orange Township. Hulse & Kundts have a rig on the Clare Fraunfelter farm, Section 10, Montgomery Township.

In Lorain County, Daugherty & Dempsey are drilling on the Jess and Anna Lewis farm, Section 15, Avon Township. Dillon & McFredericks are drilling No. 4 Cora M. Mills farm, Lot 88, Columbia Township.

In Medina County, Homer Township, the Commonwealth Gas Corp. brought in a dry hole on the Dick Barnes farm, Section 18, Homer Township.

In Summitt County, Wiser Oil Co. is drilling a second test on the Shiltz and Bailey farm, Lot 85, Bath Township. Barnhart and others are shut down on the M. G. and C. O. Osborn farm, Section 2, Richfield Township.

In Licking County, McClay Brothers have a fair gas well in No. 4 on the Emmett farm, Section 3, Perry Township, in the Clinton lime formation from 2,945-53 feet.

In Muskingum County, Hopewell Gas Co. has a light gas showing in No. 2 Phil Morningstar farm, Section 8, Brush Creek Township, in the Clinton at a total depth of 4,122 feet.

In Tuscarawas County, the Local Co. has an average gas well on the George J. Martley of the Holden Clay Products Co.'s property, in the Red Clinton formation at 5,033 feet. Ohio Falls Drilling & Supply Co. is shut down at 3,741 feet in No. 1 Long-Lichty farm, in Clay Township.

Stark County

In Stark County, Paris Township, the Timken Roller Bearing Co.'s test on the H. and M. Essick farm, is shut down at a depth of 4,500 feet. Brendall and others are drilling No. 2 T. and F. Lesser farm, Section 12, Lawrence Township. East Ohio Gas Co. brought in a nice gas well in No. 1 Mary Hinkel farm, Section 12, Jackson Township, same county, at a depth of 4,436 feet. Same company is drilling on the Leo Franks farm, Section 14, and abandoned its location on the Fred Saylor farm, Section 13, same township. Medford Oil & Gas Co. is drilling No. 1 Daisy Bird farm, Section 13, same township. Fulton Oil & Gas Co. is drilling a second test on the Henry C. Rudy farm, Section 6, same township. Brendall and others are drilling No. 1 Samuel Willaman and No. 1 D. M. Harold, both in Section 10, as well as drilling No. 1 Paul F. Scheetz farm, Section 11, Jackson Township. In the same township, the East Ohio Gas Co. made a location for No. 2 T. K. Harris farm, Section 26, and has a rig up for No. 3 same farm.

In Fairfield County, City Natural Gas Works is drilling a second test on the W. M. and H. Brucker farm, Section 2, Berne Township, and Westerm Brothers have a rig up on the S. and M. E. Miller farm, Section 29, Richland Township, same county.

In Guernsey County no completions were reported, while in Somerset Township, Belmont County, some new work is starting. William Curn and others are working on the J. A. Johnson farm, Section 15. Central Gas Co. is drilling No. 1 Grover Parks farm, Sections 14 and 15, while J. L. Jeffries and others are drilling on the Antony Barkhart farm, Section 33, Somerset Township.

In Gallia County, Cheshire Township, the Gallia Development Co. has a hole full of water in the Maxon sand from 210-24 feet, in No. 2 Sallie Steenberger farm, Section 22.

In Meigs County, the Ohio Fuel Gas Co. drilled in a gas well in No. 2-5566 on the Leonard Epple farm, Section 26, Bedford Township, at a depth of 885 feet. Same company has a gas well in No. 1-5530 on the George W. Davidson farm, Section 6, Rutland Township, same county, in the Berea sand at 1,530 feet. Fairfield Gas Co.'s No. 3 W. B. Chaney farm, Section 22, Bedford Township, same county, is a light gas well in the Maxon sand from 918-33 feet. Utsinger and Barton found a light gas showing on the William Plummer farm, Section 8, Rutland Township, in the Second Cow Run sand at 560 feet, but expect to go for a deeper pay formation. Stewart & Ross are drilling No. 5 on the S. C. and Gazelle Staneart farm, Section 6, Bedford Township. Chase and others are drilling No. 1 G. W. Ward farm, Section 4, Rutland Township. Joe Rubin and others are drilling No. 1 Charles H. Jones and others' farm, Section 5, same township, also drilling No. 1 Louisa Smith Bryan farm, Section 36, Salisbury Township. In the same township, Scioto Oil & Gas Co. is drilling No. 1 Marinda J. Stevens farm, Section 35. John Mayer and others are drilling No. 3 Virginian Johnston farm, Section 3, and A. N. Bingla and others are drilling No. 1 Ernest Diehl farm, same section and township.

INDIANA

Compiled by Paul F. Simpson, state gas supervisor, Department of Conservation, Division of Geology, by counties, of Indianapolis, Ind.

Clay County—The Ohio Oil Co. is starting a test on the St. Louis Joint Stock Land Bank farm, formerly the Hugh Stevenson farm, in Section 26, Dick Johnson Township.

Daviess County—Ben Ruble is drilling No. 1 Thomas M. Lambe, in Section 27, Harrison Township.

Dearborn County—The Dearborn Development Syndicate completed its test on the Christ Shoemaker farm, in Section 27, Kelso Township, at 1,987 feet, reporting only showings of oil and gas. It has started another test on the Jacob Steinmetz in Section 2, York Township.

Greene County — The Old Dominion Corp. has shut down its tests on the Mager and Fisher and Walter Suphine farms, in Washington Township, after having drilled each to a depth of 2,000 feet.

Hamilton County — Brown, Holeman and others are starting a well on the F. E. Applegate farm, west of Cicero.

Harrison County—The Wyandotte Oil & Gas Co. has started No. 1 Dan Cunningham, in the SW, Section 12, Taylor Township. No. 1 Bettie L. Fox is also being started by Joseph H. Kraft, trustee, in the NW, Section 7, in the same township.

Henry County—Bert Kinnamon completed a well for Henry Foster in Spiceland; production was 12,000 feet from a total depth of 922 feet. Delph & Chew will drill a well for Charles E. Jackson in New Castle.

Jay County — H. Pontius abandoned Nos. 1, 2, 3, 4 and 5 J. H. Barr, in Section 28, Wabash Township.

Knox County—The Gardner Petroleum Co. is still drilling in No. 1 M. E. Bond, in the SW, Section 14, Busseron Township, after finding salt water at 650 feet. Same company found a dry hole in its No. 1 E. W. House, in the NW, Section 16. One or two other wells are reported

(Continued on Page 109)

WESTMORELAND COUNTY, PENN., BECOMING CENTER OF INTEREST

By Staff Correspondent

PITTSBURGH, Pa., Oct. 19.—Interest in the Southwest Pennsylvania Field shifted from Somerset in Somerset County to the county lying immediately west, Westmoreland. Donegal, located in the southeast angle of Westmoreland County and near the Fayette County line and southwest of Ligonier, is the center of the interest and activity. Recent geological reports of this locality have been favorable, and having in mind the Tioga Field in the northern part of this state and the southern part of New York state, a syndicate of Pittsburgh men has leased some 35,000 acres. Plans have been made to test this locality and the syndicate has a rig building.

The West Virginia Field reported eight gassers and one oil well, with an initial production of 3 bbls. Southeast Ohio reported one gasser, and one oil producer, with an initial production of 15 bbls. Each of these fields reported two dry holes.

SOUTHEAST OHIO

Southeast Ohio's lone gasser is a 3,000,000-footer. It was a test drilled on the W. A. Swingle farm in the northeast part of Section 9 in Brush Creek Township, Muskingum County, by the Pure Oil Co. The gas is flowing from the Clinton sand and a depth of 4,141 feet.

Drilling in the shallow sands of Chatham Township, Medina County, gave the E. R. Edson & Son Co. a 15-bbl. producer on the productive M. A. and Eva Franks farm on Lot 20 of Section 16. This well, No. 27, was drilled to a depth of 489 feet and in the Cow Run sand.

In Muskingum County, the Atha Oil Co. found the Stark Land Co. property in the northeast quarter of Section 10 in Washington Township dry in the Medina sand at 4,174 feet. This well, a second test, was also dry in the Clinton sand. The E. R. Edson & Son Co.'s No. 21 on the George W. Packard No. 1 lease was reported dry at 400 feet and in the Cow Run sand. The Packard lease is in Lot 4 of Section 13, Chatham Township, Medina County.

WEST VIRGINIA

The West Virginia Field had one 1,000,000-foot gasser completed during the past week. It is the test of C. A. Jarvis and others on the M. E. Freshour farm in Center district, Calhoun County. The production in this well is natural from a depth of 1,919 feet and the Maxon sand. In the same district, the Bowser Oil Co.'s No. 5 on the W. H. Jackson farm came in as a small natural gasser after the drilling tools had been sunk to 1,968 feet and in the Injun sand. F. F. McIntosh drilled his old test deeper on the Allen Hardman farm to the Injun sand and a depth of 1,903 feet for a resultant small natural gasser. The Hardman farm is in Lee district of Calhoun County.

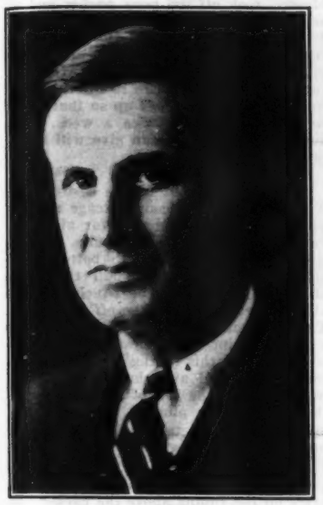
In Warfield district, Mingo County, the United Fuel Gas Co. completed its No. 4,327 on the Central Trust Co. tract, at a depth of 2,325 feet. The production in this small gasser is coming from the Big Lime and Big Injun sands. The Wayne United Gas Co.'s No. 46 on the A. W. Wilson heirs lease in Lincoln district, Wayne County, was completed after the drilling tools had been sunk to 2,998 feet, as a fair gasser. The Shale and Big

(Continued on Page 70)

Natural Gas Industry Developments

BEAL MEDAL AWARDED TO A PHILADELPHIAN

In recognition of the best paper on a technical subject presented at last year's convention of the American Gas Association, Philip Thornton Dashiell, engineer



P. T. Dashiell

of works of the Philadelphia Gas Works Co., Philadelphia, Pa., was awarded the Beal Medal, at the annual convention of the association in Atlantic City. The presentation was made by T. R. Beal, president of the Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., whose family has donated this coveted award for years.

Mr. Dashiell won this distinction through his paper on "The Use of Heavy Fuel Oil in the Manufacture of Carburetted Water Gas," submitted last year before the technical section of the association. Mr. Dashiell has been identified with the United Gas Improvements Co. since 1899.

WYOMING FRANCHISE FORFEITED

CASPER, Wyo., Oct. 17.—C. Frank Bautch and associates have forfeited their franchise for a natural gas distribution system in Lusk, eastern Wyoming. The company had a contract for a natural gas supply in the Lance Creek Field with the Ohio Oil Co. and proposed to lay a line from Lance Creek to Lusk. The franchise called for a time limit of September 15. The owners explained that, owing to the present financial situation, they were unable to finance the proposition and had therefore temporarily abandoned the project.

HOLDENVILLE REDUCTION

Holdenville, Okla., city officials advised the Oklahoma State Corporation Commission that an agreement for a reduced domestic gas rate had been reached with the Central States Power & Light Co. The new rate will be 38 cents per 1,000 feet. The former rate was 45 cents.

TEXANS SEEK LOWER RATES

CUERO, Tex., Oct. 19.—Cuero officials will join officials of other towns in this district in whatever movement they sponsor in securing reductions of rates to consumers of natural gas, Mayor LeRoy Hamilton announced. Seven cities of this section met in Yoakum to decide plans for a campaign seeking lower gas rates.

THREE VIRGINIA CITIES GETTING NATURAL GAS

RICHMOND, Va., Oct. 19. — Three Virginia cities have been connected with the natural gas system of the Columbia Gas & Electric Co. in the first distribution project of the company to be completed in this state.

Through its subsidiary, the Virginia Gas Distribution Co., the Columbia system is now serving gas to customers in Covington, Clifton Forge and Lexington. The gas was turned on to these cities last week.

Plans are going forward for piping of gas to Buena Vista, Culpepper, Warrenton, Manassas and the marine base at Quantico.

This is the first use of natural gas in Virginia. The lines of the Columbia system extend from Texas to Philadelphia.

GAS UTILITY SALES

A decrease of 7 per cent in gas sales and 4 per cent in revenues is indicated by the comparative operating reports of manufactured and natural gas utilities for the first eight months of 1931.

Reports from a group of natural gas companies representing more than 85 per cent of the public utility distribution of natural gas indicate sales of nearly 465,000,000,000 feet for the first eight months of 1931, a decline of only 9 per cent from the corresponding period of 1930. The revenues of these companies for the same period aggregated about $193,000,000, compared with $206,000,000 a year ago.

Natural gas sales for industrial purposes declined by more than 15 per cent, but this was practically offset by the industry's program of expansion into new territory where gas service was not previously available. The consumption of natural gas for the generation of electric power during the first eight months of 1931 continued at a rate about 8 per cent above the preceding year, despite the fact that during the same period the production of electric power decreased by nearly 5 per cent.

NEWTON, KANS., FRANCHISE

KANSAS CITY, Mo., Oct. 19. — The Newton Gas Co., of Newton, Kans., has filed an ordinance calling for a vote on a 20-year gas franchise for the Cities Service subsidiary. The company offers to reduce the rates approximately 26 per cent. The new rate would compare favorably with that now paid by other cities in this section of Kansas.

The city commissioners are negotiating for a clause by which the city might have the right to appraise and buy the gas system within five years. The commissioners have shelved a municipal ownership proposal, twice refusing to act on petitions asking for a vote on bonds for a municipal gas plant.

CUT COLLEGE RATE

Oklahoma State Corporation Commissioners have approved tentatively the application of the State Board of Agriculture for a reduced gas rate at the Oklahoma A. & M. College. The Central State Power & Light Co. was asked to reduce rates to the school from an average of 20 cents to 14 cents per 1,000 feet. The board contended the Oklahoma Natural Gas Co. was servicing the University of Oklahoma at an average of 12 cents per 1,000 feet.

FOR LOWER GAS RATES

DENTON, Tex., Oct. 19. — Denton's city commission passed an ordinance lowering the municipal gas rate from 75 cents to 50 cents.

LONE STAR GAS CORP. VALUATION ESTIMATES

Harrison Smith, engineer for the Lone Star Gas Co., testified before the Oklahoma Corporation Commission that the company's properties serving 26 state cities are worth approximately $30,000,000 more than the figure set by the commission auditor.

The valuation report was presented by the Lone Star to combat applications for rate reductions. Mr. Smith testified the value of the company's properties was $70,593,343, as of June 30, 1931, and based on the reproduction cost.

Paul Reed, commission auditor, testified the value was $39,176,207.

Lone Star attorneys contended Mr. Reed's valuation was based on the book value rather than on the actual cost of reproduction.

LIFE SAVING AWARD

Because he sacrificed his life in the rescue of a fellow-workman, the memory of Frank E. Steinhardt, a former foreman at the Hunts Point plant of the Consolidated Gas Co., of New York, was honored at the thirteenth annual convention of the American Gas Association in Atlantic City, N. J. The posthumous award was made by Clifford E. Paige, president of the association, and it was received by W. C. Morris, vice president and chief engineer of the Consolidated company, on behalf of the widow. Each year this award is made by the American Gas Association in recognition of the most meritorious deed in the saving of life in the gas industry.

When J. Newell was sent into a producer at Hunts Point by Foreman Steinhardt in July, 1930, the workman was overcome by gas. Mr. Steinhardt heard Newell's cries for help, entered the producer and assisted the latter to safety. Mr. Steinhardt, a man of large stature, also lost consciousness and efforts to lift him out failed. He was not released until after the producer had been cut apart, and later died at a hospital.

ASK BILLINGS RATE CUT

DENVER, Colo., Oct. 17. — Billings citizens have filed complaint with the Montana Public Service Commission asking a 50 per cent reduction in natural gas rates. The Billings Gas Co. and the Gallatin Natural Gas Co., are defendants. These companies are subsidiary to the Ohio Oil Co. The complaint states that a fair value of the combined property of the companies is not to exceed $824,021.03, their average gross income $602,401.20 and their average operating expense $228,590.19 making their earnings $373,811. The complaint suggests that a fair rate of return would be 8 per cent.

GAS SERVICE AT GUTHRIE

Natural gas has been turned into the mains of the Western Service Corp. at Guthrie, Okla., through the newly completed gas distribution system. The supply comes through a pipe line constructed by the company from the Oklahoma City Field to Guthrie. The Guthrie Gas Service Co., which has served this city for several years, has 2,700 meters in use in Guthrie.

CANADIAN WESTERN EARNINGS

CHATHAM, Ontario, Oct. 17.—Earnings of the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary for July, 1931, were $67,405 compared with $63,314 in July, 1930. Earnings for seven months ending July 31 were $1,212,019, a decrease of $131,953 from the previous year.

MADE VICE PRESIDENT

—Photo by Alvin C. Krupnick Co.

B. F. Pickard

B. F. Pickard, executive assistant of the Oklahoma Natural Gas Corp. since 1930, has been promoted to vice president, it was announced by E. A. Olsen, executive vice president. Mr. Pickard's promotion is effective immediately.

NEW COMPANY FORMED IN NEW YORK FIELD

NEW YORK, Oct. 19.—Formation of the Mutual Natural Gas Co. under the laws of Delaware to develop, produce, transport and sell natural gas is announced. The company's authorized capitalization consists of 300,000 shares of no-par common stock, of which 205,300 shares are to be outstanding. The company owns or holds options, rights or leases on more than 20,000 acres of gas lands in Tioga and Susquehanna Counties, Pennsylvania, and Allegany County, New York. It is to be managed for three years by the Penn Petroleum Co. and will sell its gas to the Pennsylvania Power & Light Co., an associate of the Electric Bond & Share Co.

Earl C. Vedder, mayor of Olean, N. Y., is president of the company. The directors include: C. M. Nevin, assistant professor of structural geology at Cornell; Harry K. Brown, attorney, Hornell, N. Y.; F. M. Leeston-Smith, New York; J. H. Wallin, capitalist, Philipsburg, Pa.; R. R. Murray, vice president in charge of operation, Wellsville, N. Y., and R. B. Bossler, geologist of Penn Petroleum Co., Olean, N. Y.

CRAIG, COLO., FRANCHISE

DENVER, Colo., Oct. 17. — Applications have been made to the trustees of Craig, Colo., for a franchise to serve natural gas. The applications are from Ohio Oil Co., and from A. J. Hardendorf of the Eastern Colorado Gas Co. and the Colorado Gas Utilities Co. The Ohio Oil Co. controls leases on several structures near Craig and A. J. Hardendorf is said to have an agreement with Midwest Refining Co. to develop some of its holdings near Craig. It may be necessary to hold a special election.

BENZOL FROM NATURAL GAS

WASHINGTON, D. C., Oct. 19.—It is reported that a Japanese research institute will study the manufacture of benzol from local natural gas.

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

BETTER GO ON WITH ROTARY

We are interested in drilling some 10 miles from the city of Regina, Saskatchewan, in a wildcat field. At the present time the well is down 2,855 feet and we have been using a rotary drill. Just now we are not drilling owing to financial conditions, but we hope to be able to start again soon. Several persons interested in the well have brought up the question of the relative value of the rotary method and the cable-tool method of drilling in a wildcat field. During our operations so far whenever we have had a change of formation we have taken a core, and our drillers say that when this is done there is no question but that the rotary has many advantages over the concussion drill.

I would appreciate it if you would state whether it would be advisable to finish operations with the concussion drill or to continue with the rotary. There has been so much argument in favor of each way that I would like to have an opinion from someone who has studied such matters.—J. W. R.

In view of the fact that you already have a rotary-drilled hole 2,855 feet deep, it would seem best to continue drilling with the present outfit. While there are advantages in the use of cable tools (concussion drilling) in a wildcat well, one of the more important of which is the ability of the driller to examine samples of cuttings at frequent intervals as they are brought to the surface by the bailer, still using modern methods with the rotary drill it is possible to check the formations as they are encountered.

It is suggested that the driller use some type of instrument to check the vertical position of the hole and map it as it progresses. It would be best if this check could be made with an instrument that will give both departure from vertical and the direction of drift, so that cores taken may be properly oriented and the position of the various strata penetrated accurately known.

Coring can be resorted to as frequently as conditions indicate there is a change in formation and while this may be more costly than straight drilling it is necessary if all possibility of drilling past productive formations is to be excluded. Continuous sampling of the rotary drill cuttings is possible. Such samples can be examined by a geologist and a good log prepared. This, however, will necessitate the installation of automatic sampling machinery in the discharge line from the well head and will increase the cost of equipment.

There are other things that can be done to check conditions in the rotary hole, such as the use of electric devices to indicate change in strata, increase or decrease of water in formation, type of water encountered, and also give data about formations containing oil and gas.

An informative article about the "Electric Coring Method" is printed in the February 6, 1930, issue of The Oil and Gas Journal.

Wildcat wells can be drilled with rotary outfits quite satisfactorily if the operator is willing to pay the contractor to use certain instruments and methods. Usually these extra precautions are not taken, and the well is drilled wholly upon the experience of the driller, with coring resorted to as he considers it necessary. Under such conditions it is advisable at least to have a consulting geologist in charge of the work and to arrange with the drilling contractor to get cores for the geologist when and where he wishes them.

With cable-tool drilling the experienced driller can note changes in formation, can test for oil or gas showings in a simple manner, and if formation changes indicate that commercial production is near he can regulate his work so as to permit drilling into the pay zone carefully. After the oil and gas have been found he can continue the hole by degrees until the stratum is proven or disproven for commercial production.

As stated at the beginning it is believed that you safely can go ahead with the rotary outfit now at the hole, but the employment of a competent consulting geologist to check developments is recommended.

REFINERY PIPE-FITTING JOBS

I wish you would recommend some literature on modern refinery construction. I would like to have detailed explanation, beginning where the crude oil comes in and ending with high-grade gasoline, including all the processes through which the crude must pass. I especially want plans of the complicated pipe fitting of the modern refinery. I am doing pipe-fitting work in a refinery, but I am a second-class workman because I am unable to understand the blueprints which the foreman has. He usually has to draw diagrams for me instead of handing the blueprints themselves to me.—B. H. J.

It is difficult, perhaps impossible, to name any one book which would give you the fundamental information on refinery pipe fitting which you seek. A book which would be of distinct value to you, however, in gaining a general knowledge of refining and refinery processes is that written by H. S. Bell on "American Petroleum Refining." It may be obtained from the D. Van Nostrand Co., 8 Warren Street, New York.

It is suggested, too, that you read the articles which appear regularly in The Oil and Gas Journal dealing with new developments in the refining field. The basic principles of pipe fitting may be obtained through the blueprint reading course offered by correspondence schools.

GAS WELLS PRESENT PROBLEMS

The two gas wells described below have to be blown, one of them every day and the other about twice a week in order to keep them working. Can you offer any advice as to how this may be avoided?

Well No. 1, capacity 250,000 feet, was drilled in March 18, 1931, and turned into the line a month later. It was tubed with new 1-inch tubing and packer set at 610 feet. The top is equipped with a tee and a gate valve, with plug in tee. The gate is placed below the tee, and the tee leads over to an automatic drip, which is freeze-proof. The well began making water soon after being turned into the main. It came in with a rock pressure of 190 pounds and almost immediately settled to a working pressure of about 130 pounds. The working pressure now is about 100 to 110 pounds, depending upon water conditions. We can blow the well and it will gulp and chug water, about a pint at a time for 15 minutes, and then sends out a constant spray. We turn it into the line and it starts off with a working pressure of 115 pounds. By the same time the next day the pressure is down to 90 pounds perhaps, never more than 100, and the differential on our chart has dropped from about 5 inches to about 2 inches on a 402 orifice disc against a 50 to 60-pound line pressure. The water will not enter our automatic drip or our line drip either, but will clog up the well again so that it has to be blown. No doubt the well was drilled a little too deep, but the structure did not show water while we were drilling it and the top of the sand is 611 feet, so it should be a long-lived well if we can get it to function properly. We have one well besides the two I am describing which is in the same sand, but which lifts the water into the drip nicely.

Well No. 2, capacity 554,000 feet, is a combination well, having two gases tubed, one in the Peru sand and one in the Squirrel. It is the Squirrel sand that is giving us trouble in both No. 1 and No. 2 wells. The Peru gas in this No. 2 well is shut in, as it is of lower pressure and will not buck our present line pressure. We placed a packer above the Squirrel sand at 561 feet, another packer below the Peru sand at 497 feet and a plate packer above the Peru at 483 feet. There are two lines of new 2-inch tubing coming out of the well and we had the well in the line for only a short time when it began making water. This well was drilled in January 1, 1931, and turned into the line February 26. It had an original open flow of 1,320,000 feet and a rock pressure of 200 pounds. It now is working at about 120 pounds and builds up when shut in for 15 minutes to about 160 pounds. We set a 1-inch bleeder line in this well June 22, thinking the open flow would be increased again if we could get the water off the well. This bleeder was set with a pony packer. The well would not raise the water into the line drip, but had to be blown every other day. So a few weeks ago we removed the 1-inch bleeder, took off the pony packer and reset the bleeder with the perforation about 10 feet off the bottom of the well, and a stuffing box on the top instead of the pony. We believe we helped the well some, but it still refuses to lift the water into the drips and clogs up so that it has to be blown about twice a week. Any suggestions that you can give will be appreciated.—H. L. J.

It is believed that in the case of well No. 1 you have placed the cage and the 2-inch perforated joint too far above the bottom to get the best results. If the well is cased from top to bottom it is believed that you could pull the string of tubing and remove the 2-inch cage and all pipe below it and take off the packer. Then you could run the tubing again with a 20-foot joint of perforated pipe at the bottom. Run this tubing close to the bottom of the well and shut in the casing with a tee at the top of the casing with the branch side plugged. In this plug make a hole and tap for connection for pressure gauge.

On the top side of the run of the tee use a packer around the tubing with a valve on the tubing above the packer. In this way the gas can accumulate in all of the casing in the hole. The pressure will build up against the shut-in head on the casing and will be registered on the gauge at the well head. The casing above the gas sand will act as a reservoir for accumulation of excess gas under pressure.

With this arrangement it is believed that you could so manipulate the valve on the tubing as to cause the gas to flow at the proper rate to remove the water from the well as fast as it flows in.

If the hole is not cased it probably will be necessary to run the tubing with packer much as you now have it hooked up. To get the tubing back in the well and remove the accumulated water in the hole it is suggested that the casing tee be used and the tubing packed off.

The tubing should be lowered gradually into the water. By shutting in the top of the casing it will be possible to build up pressure enough to blow off the upper portion of the water in the hole and when the water level is lowered somewhat the tubing should again be lowered into the water and some more of it blown off.

This lowering of the tubing should be repeated until the 20-foot perforated joint is at the bottom of the hole and the valve on the top of the tubing should then be opened enough to permit the water to be discharged along with the gas as it comes into the well.

In the case of well No. 2 it is much more difficult to give any suggestions because the present hookup is not clearly explained, but it would seem that here too the perforations are too high in the hole and you might try running the tubing again with a 20-foot joint of perforated pipe at the bottom of the well.

There are so many unknown conditions, even though you have given a detailed description of the two wells, that you might do well to call in a gas engineer to assist you on your problems.

You can obtain from the Superintendent of Documents, Washington, D. C., for 10 cents a copy of Technical Paper 460, entitled "Design and Operation of Gas Well Siphons" issued by the Bureau of Mines which should give you valuable information on this general subject and from it you may be able to work out your problems.

WHY WAS IT CALLED THAT?

PRIVATE CAR

The designation "private car" ordinarily brings to mind a luxuriously appointed railroad car in which the president or other executive of the line rides. Sometimes of course it describes an automobile reserved for the individual use of some more or less important person. In the parlance of oil transportation, however, it refers to a tank car which is not owned by a railroad company. Most of the tank cars in the United States are such private cars, and the owners are remunerated for the use of them on the basis of the number of miles covered while being conveyed from one point to another on the railroads.

PROVE
TO YOUR OWN SATISFACTION
THAT IN LAY-SET *PREFORMED WIRE ROPE INTERNAL STRESS IS ELIMINATED . . .*

This test, as pictured above, is conclusive proof that internal stress does not exist in Lay-Set Preformed Wire Rope. (These illustrations are made from actual unretouched photographs.)

But don't try it with ordinary wire rope! Ordinary wire rope is so bound up with stress that the moment you remove the seizing, strands and wires straighten out and fly apart like a coiled-up spring suddenly released from tension . . . let alone trying to unwind or remove an individual strand.

Lay-Set Wire Rope is preformed—meaning that strands and wires are set to carry their natural helical shapes. They lie side by side without straightening-out effort, and *without internal stress.* That is why crown wires wear all the way through before they finally break, giving full life service instead of breaking from fatigue long before worn through.

Compare the service of Lay-Set Preformed Wire Rope with the service you have been getting from ordinary wire rope. You will find that it exceeds by 30% to 300%, depending upon the character of the service and the type of the equipment. This is a saving worth going after.

Let us send you our "Book of Facts" and a sample piece of Lay-Set Preformed Wire Rope, so you can make this test yourself. Write on your business letterhead.

HAZARD WIRE ROPE

America's First Wire Rope—Since 1846

HAZARD WIRE ROPE COMPANY
WILKES-BARRE, PENNSYLVANIA
1112 Fair Building, Fort Worth, Texas

New York Pittsburgh San Francisco Chicago Birmingham Denver Philadelphia Fort Worth Los Angeles Tacoma

HAZARD LAY-SET PREFORMED WIRE LINES

Oil Industry Equipment and Supplies

CANNOT PUT FRONTGRIP WRENCH ON PIPE WRONG

The "Frontgrip" chain wrench, manufactured by the Engineers Machinery Corp., Stamford, Conn., and marketed by the Multiple Selling Corp., 51 East Forty-

second Street, New York, embodies the following advantages, according to the manufacturer: (1) No jamming of chains under pressure, chain instantly releases; (2) cannot be put on wrong; (3) turns pipe right or left at one setting without adjustment; (4) it ratchets (5) permits handling pipe in corners, coils and banks, owing to its "frontgrip" design; (6) chain adjusts while it is on the pipe; (7) has greater chain wrap; and (8) on account of its design it does not depend on its teeth to hold.

Six sizes of the wrench are made to handle different sizes of pipe as follows: No. 1, one-half to 1½-inch; No. 2, three-quarter to 2½-inch; No. 3, 1½ to 4-inch; No. 4, 2 to 6-inch; and No. 5, 3 to 8-inch.

The ratchet action is designed to give a positive grip at any angle and a quick release. The pressure is distributed evenly through the jaw and chained over virtually the entire surface of the pipe, thus reducing the danger of crushing or distorting the pipe. The wrench is reversible and can be operated in either direction without removing from the pipe or adjusting the chain.

WESTINGHOUSE MAKES CHANGES

The industrial sales department of the Westinghouse Electric & Manufacturing Co. has been reorganized under the direction of O. F. Stroman, industrial sales manager. The reorganized department is composed of units grouped according to the main classifications of industry. Two assistant sales managers and 14 divisional managers have been appointed and the new organization also provides for the grouping of specialized engineers with every sales division. Bernard Lester and C. B. Stainback have been appointed assistant sales managers. Mr. Lester will have general charge of directing from headquarters the development of business with industrial users of electrical equipment. Mr. Stainback will have charge of apparatus applying to these industrial groupings.

NEW FLOODLIGHT ANNOUNCED

A new and larger handy floodlight, the "Senior," designed for general utility floodlighting and employing a 200-watt incandescent lamp has been announced by the General Electric Co. Offered as a supplement to the 100-watt handy floodlight projector, the new "Senior," smaller and less expensive than the standard floodlighting projectors, is expected to find uses where light requirements do not necessitate the larger, standard floodlighting units. Giving double the amount of light obtained from the smaller 100-watt handy it will fulfill requirements where a higher intensity of illumination is desired.

NOTES ABOUT TRADE LITERATURE

"Making Way for the Pipe Line" is among interesting articles in the October number of the Yellow Strand, published by the Broderick & Bascom Rope Co., St. Louis, Mo.

Clark Brothers Co., Olean, N. Y., is mailing an 8-page illustrated bulletin on natural gas engines for industrial plants, pumping plants and refineries.

The Westcott Valve Co., East St. Louis, Ill., has announced a 130-page catalog containing information covering valves of the gate type, both in steel and iron, together with fittings and combinations exclusively designed for the oil and gas industry.

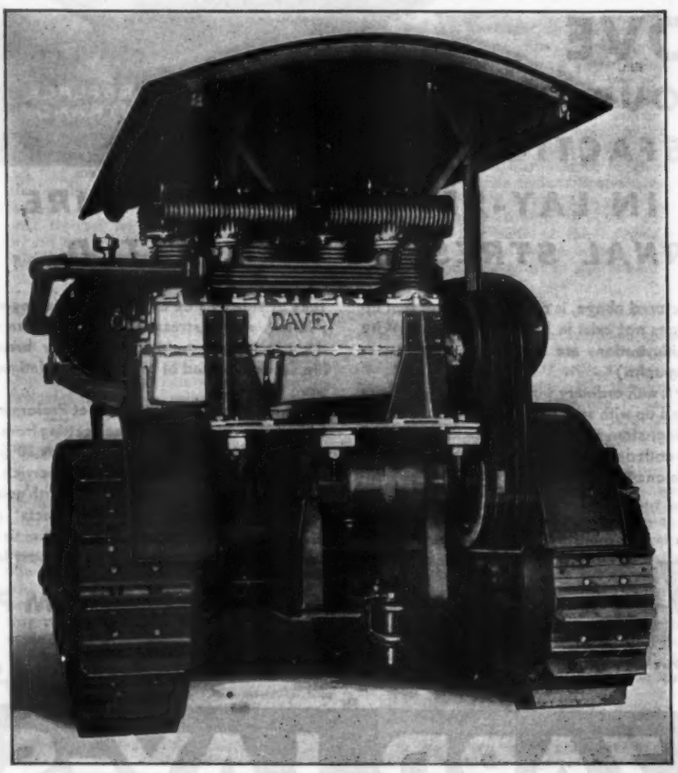
The Columbian Steel Tank Co., Kansas City, Mo., has issued a 16-page booklet on truck tanks, containing interesting data on safety equipment and illustrating several types of delivery outfits. Copies may be obtained by addressing the company.

A 56-page catalog, illustrated in colors, devoted to the Brown electric flow meters, is being sent out by the Brown Instrument Co., Philadelphia, Pa.

The Chapman Valve Manufacturing Co., Indian Orchard, Mass., has issued a bulletin describing the company's new lubricated plug cocks.

The No. 32 condensed catalog of Beaver pipe tools, prepared by the Borden Co., Warren, Ohio, gives the user and jobber the essential information about the Beaver line. The company says this catalog "makes it very easy for a man to locate exactly what he wants without thumbing over a lot of horn tooting."

DAVEY COMPRESSOR MOUNTED ON CATERPILLAR SIXTY



The latest development in Davey "air-cooled" portable air compressors is the 310 cubic foot unit for mounting on the "Caterpillar" Sixty tractor, as shown in the illustration. Through the use of this compressor unit, made by the Davey Compressor Co., Inc., Kent, Ohio, owners of "Caterpillar" Sixty can have the advantages of a portable air compressor of large capacity, without a separate trailer-mounted unit.

The mounting consists of steel extensions which bolt to the tractor frame out of the way at the rear of the tractor. This mounting and location do not interfere with normal tractor drawbar operation. The light weight of the compressor unit and mounting, 1,800 pounds complete, does not interfere with tractor balance or pressure on the treads.

The compressor drive is by the tractor engine through five V-belts and the standard "Caterpillar" stationary drive which embodies a clutch. The cushioning effect of this drive absorbs the pulsating compressor torque and eliminates undue wear or strain on the tractor mechanism. This driving arrangement also permits the compressor to be started or stopped instantly, whenever desired, by a slight movement of the conveniently located clutch lever.

MEN KNOWN *in* THE EQUIPMENT FIELD

H. L. Robinson, recently appointed general sales manager of the Foster Wheeler Corp., New York, has been associated with Foster Wheeler interests

H. L. Robinson

for many years, having entered the service of the Wheeler Condenser & Engineering Co. prior to the formation of the Foster Wheeler Corp.

Experience and training are believed to have fitted Mr. Robinson well for his new position, his work having included large oil refinery contracts as well as power plant equipment. His familiarity with foreign conditions is of importance in connection with the company's operations abroad. Early this year he accompanied J. J. Brown, chairman of the board, on a European inspection trip, including England, France and Germany.

BALLASTING THE U.S.S. AKRON

With the introduction of helium as a lifting gas for airships, a new problem in ballasting was presented to airship engineers. So long as hydrogen had been used, the loss in weight caused by fuel consumption was compensated for by release of the hydrogen gas at little cost. As helium is produced at a higher cost than hydrogen, it is undesirable to valve the gas freely. Consequently, ballast water recovery systems are employed on the large airships, such as the Akron, to compensate for the loss in weight due to the burned fuel. The system is installed in connection with the engine and the water in the exhaust gases which result from the burning of fuel is condensed. This water is pumped into containers. In the Akron the recovered water is pumped to the containers by means of eight Goulds pumps. These pumps are fabricated in a large part from aluminum alloy and it has been possible to reduce the weight to approximately 16 pounds. Normally this pump, constructed of cast iron, weighs 110 pounds.

A paper on "Welded Steel Gears from Blanks of Lukenweld Construction," by Everett Chapman, director of engineering and research for Lukenweld, Inc., Coatesville, Pa., is being distributed by the company in the form of a bulletin.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

FURNACE VOLUME AND COMBUSTION DATA

What volume of combustion space is necessary to burn 1 bbl. of fuel oil or any other suitable unit per hour? How much air is needed for the combustion of a barrel of oil? What ratio exists between the size of the stack and the combustion volume of the furnace? What velocity of flue gases through the furnace and up the stack is considered good practice?—M. J. H.

I do not know of any simple method for determining furnace volume or any rule of general application for estimating combustion conditions. There are so many things to be considered that each installation must be looked upon as a special problem when the maximum efficiency is sought. However, the discussion following with the approximate results should enable you to check local conditions.

The elements which have to be considered for estimating combustion conditions when burning fuel oil, are carbon, hydrogen and sulphur. These unite with the oxygen, supplied in the air, to form the respective oxides. The quantitative relationship is indicated in the table:

Combustion of carbon, hydrogen and sulphur

$$C + O_2 = CO_2$$
$$12 + 32 = 44$$
$$1 + 2.67 = 3.67$$

$$2H_2 + O_2 = 2\,H_2O$$
$$4 + 32 = 36$$
$$1 + 8 = 9$$

$$S + O_2 = SO_2$$
$$32 + 32 = 64$$
$$1 + 1 = 2$$

In this table the combining weights are placed below the symbol for the elements, and the equivalent molecular weights of the compounds produced, then below these the smaller numbers may represent pounds. That is, for example, 1 pound of carbon requires 2.67 pounds of oxygen for perfect combustion with oxygen to produce 3.67 pounds of carbon dioxide.

The atmosphere is, for estimating purposes, composed of 23.15 per cent by weight of oxygen. This reduced to a pound basis is equivalent to 1 pound of oxygen in each 4.32 pounds of air.

Remembering these principles, all that is necessary in order to calculate the quantity of air required for the combustion of a fuel is to know its chemical composition in terms of ultimate analysis. A medium grade fuel oil may contain—carbon 84.5 per cent, hydrogen 13.5 per cent, sulphur 0.8 per cent. Then

$$.845 \times 2.67 = 2.256$$
$$.135 \times 8 = 1.080$$
$$.008 \times 1 = .008$$
$$\text{Total} = 3.344$$

This shows that the theoretical quantity of oxygen required for the burning of each pound of this oil is 3.344 pounds. Hence, $3.344 \times 4.32 = 14.45$ pounds of air will furnish the required quantity of oxygen. Since one pound of air is equivalent to a volume of 12.38 cubic feet, $(14.45 \times 12.38 = 179)$, 179 cubic feet of air will be required for each pound of oil. The usual practice is to allow 200 to 250 cubic feet. For approximate estimates a barrel of oil weighs 300 pounds, but knowing the gravity of the oil the exact weight of a barrel may be obtained from the standard tables.

It is not possible to burn a fuel under industrial conditions so as to maintain the maximum theoretical quantity of carbon dioxide because the conditions are not under the delicate control necessary to accomplish this ideal result. The best results that may be accomplished are those where the quantity of carbon dioxide in the flue gas is nearest to the theoretical, with no carbon monoxide. It is much better to have 11 to 12 per cent carbon dioxide and no trace of the monoxide, than to produce 15 per cent carbon dioxide and 1 per cent carbon monoxide.

The furnace volume should be such that the oil burned per hour per cubic foot of furnace volume will not exceed 10.8 pounds, according to investigations and regulations of the U. S. Navy. Design and operation have everything to do with adequate furnace volume; and the modern recirculating furnace, with the auxiliary apparatus permitting large percentages of preheated excess air to be used, has caused extensive modifications of our ideas concerning industrial combustion.

The intensity of draft is usually indicated in inches of water. The weight of a cubic foot of air at normal temperature is 0.0761 pound and at 500° F. it is 0.0414 pound, or a difference of 0.0347 pound. A chimney 100 feet high, freely suspended, would have a pressure at its base of 3.47 pounds. The weight of a cubic foot of water is 62.32, so an inch would exert 63.32/12, equivalent to 5.193 pounds per square foot. This stack at the temperatures stated would show a draft 3.47/5.193, or approximately 0.67 inch of water.

PUBLICATIONS

In your issue September 17, Page 58, you refer to publications of the Institution of Petroleum Technologists and Industrial and Engineering Chemistry. Will you kindly advise where these may be obtained together with the price for single copies?—W. L. A.

The Institution of Petroleum Technologists is located at Aldine House, Bedford Street, Strand, London, W. C. 2, England. Copies of the journal of this society may be purchased for 7s 6d each.

Industrial and Engineering Chemistry is one of the publications of the American Chemical Society, Mills Building, Washington, D. C. Single copies are sold for 75 cents.

OCTANE NUMBERS AND OTHER VALUES

What relationship exists between the H.U.C.R. values, expressed in Ricardo units, and octane numbers? Could you publish a table showing this relationship?—M. J. H.

I do not know of any table showing the relationship between H.U.C.R. values and octane numbers. No doubt such a table could be arranged if a series of fuels were tested in both the Ricardo engine and the C.F.R. engine. With the tentative adoption of the C.F.R. method by the American Co-operative Fuel Research Committee (S.A.E.), and the Knock Rating Committee of the Institution of Petroleum Technologists, there should be little demand for knock ratings of a motor fuel in other terms than octane numbers, as found by means of the standard C.F.R. apparatus.

Some results obtained by Hubner and Murphy, reported in The Oil and Gas Journal, April 30, 1931, page 22, may be used to show the effect of varying compression pressure and at the same time give the knock rating in both benzol equivalents and octane numbers. The following is quoted from this article:

Octane No.	Benzol equivalent	Comp. pressure lbs./sq. in.	Degree spark advance unknown fuel	Degree spark advance matched blend
87	70	185	17	11
77	62	160	15	10
64	51	140	13	9
55	42	130	10	8
49	35	125	8	7
29	0	118	7	7

It is interesting to note, however, that the difference between the benzol equivalent and octane number ratings of a fuel determined at a 15° spark advance and at the degree spark advance for maximum detonation is not great for fuels lower in antiknock value than standard Ethyl Gasoline. This difference increases with an increase in knock rating, and, if not regarded, will cause a considerable error in the determination; as an example, a fuel rating 59 benzol equivalent or 74 octane number and a fuel rating 73 benzol equivalent or 91 octane number with the proper spark advance for maximum detonation, would rate 58 and 71 benzol equivalent or 73 and 89 octane number respectively, with a 15° spark advance.

HUMIDITY AND MOTOR PERFORMANCE

Why does an automobile engine seem to run smoothly in the evening or when there is moisture in the air? Why is it that the several devices for introducing moisture to the gasoline-air mixture are no longer on the market? Does the addition of moisture cause any ill effects on the valves, cylinders, or pistons?—D.L.S.

There is a tendency for moisture to improve the performance of an internal combustion engine through slight reduction in the combustion knock, possibly the formation of lighter and fluffy carbon, but there are decided objections to its use.

A technical article, Atmospheric Humidity and Engine Performance, by A. W. Gardner, S.A.E. Journal, 24, 155, 1929, may give some suggestions of value. According to Mr. Gardner, there is a definite decrease in brake torque with increasing humidity, the data indicating a decrease of 7.2 per cent in indicated torque. With fixed spark advance, the loss would be greater. As to air-flow, the volumetric efficiency decreased about 2 per cent at high humidity. According to this special investigation, no change was indicated in specific fuel consumption.

"It seems that water, introduced as vapor, is relatively ineffective in suppressing detonation, in spite of a marked slowing up of the combustion rate. Mixture temperatures increased at high humidity. The increase is explainable on the basis of the increased specific heat of the air-vapor charge. Hence, fuel vaporization has a lesser effect on the charge temperature at the port. In addition, the ratio of fuel weight to moist air weight decreases. The effect of water vapor in suppressing detonation is so small that it is negligible."

The mechanical difficulties in the way of taking advantage of any humidity include: The radiator cannot adapt itself to the two conditions of both dry and wet atmospheres, and it is not possible to have the air-intake and carburetor settings self-adjusting to dry and moist atmospheres. The most serious objection to the introduction of moisture with the motor fuel is that water forms sulphuric acid from the small quantity of sulphur present in both gasoline and lubricating oil, which unites first with oxygen. Under normal conditions this small quantity of sulphur does no harm, but when converted to sulphuric acid, with the aid of a small quantity of water, it becomes a very corrosive agent which has been known to do serious damage to cylinders, valves and pistons.

CAMPHOR AND SULPHUR TARNISHING

I am informed that if a piece of gum camphor is placed in a chest of silverware it will prevent tarnishing due to hydrogen sulphide which permeates the atmosphere in this country. Is this true? If not, do you know of anything else that would help to prevent it?—F. R.

Camphor is used with shellac in a solution of alcohol as a constituent of varnishes and lacquers to prevent the tarnishing of metals and especially silverware. A small piece of gum camphor is used in jewelers' cases and chests to reduce tarnishing of silverware.

Use in either form cannot be expected to do much good, except when sulphur is present in the atmosphere in very minute quantities, and certainly not where there is enough hydrogen sulphide in the atmosphere to be detected by its odor.

I do not know of any substance that will be found satisfactory for absorbing any form of sulphur from the atmosphere in a selective way so as to prevent action on silver. The only way that valuable pieces may be well protected is to cover them with a coat of varnish, such as is mentioned above.

PROPERTIES DOMESTIC FURNACE OIL

Can you furnish the tests for a good 36/40 furnace oil? I do not want general specifications but would appreciate the exact tests of a representative oil of this grade.—P. G.

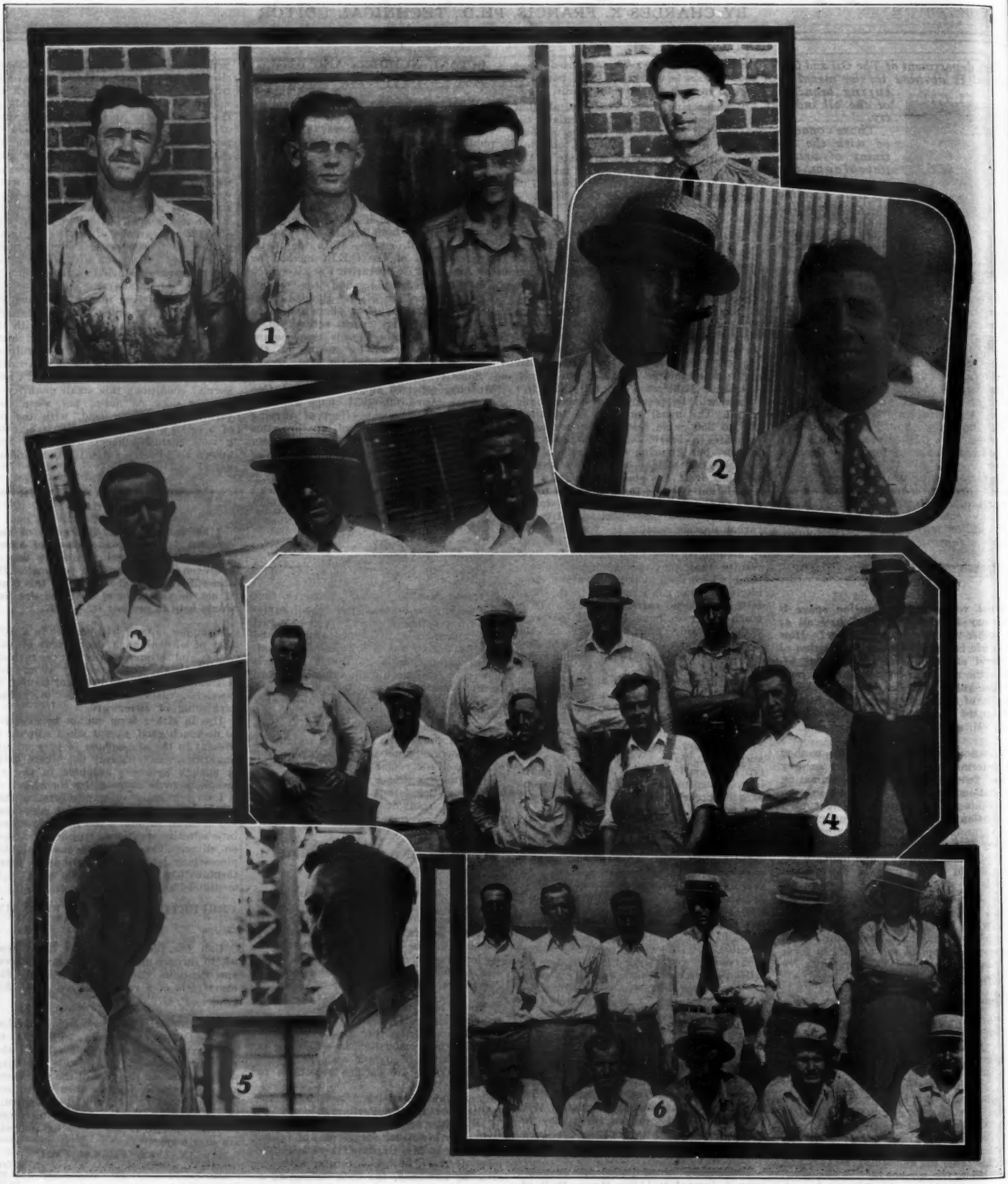
The properties of any special fraction obtained from petroleum will vary to some extent with the crude oil and the refining process. As a rule exacting specifications on the part of the purchaser are not advisable because then the source of supply may be limited and consequently a higher price charged. The determinations reported in the following analysis are maximum:

ANALYSIS FURNACE OIL

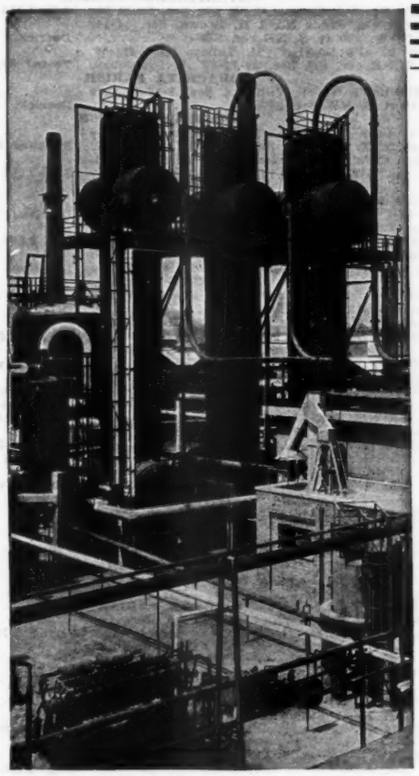
Gravity	35/40
Flash, closed	135°/145° F.
Pour point	0° F.
Sulphur, per cent	0.35
Sediment and water	none
50 per cent over	460°
Endpoint	550°
Color N.P.A.	2
Odor	sweet
B.t.u. per pound	19,600
B.t.u. per gallon	137,000

This analysis has been furnished from a refiner near your city in Ohio.

Scouting Here and There With The Journal's Cameras



1—Frank Fowler, chemist, J. W. Russum, chemist, W. A. Peck, clerk, and C. M. Boone, chief chemist, Eldorado Refining Co., Eldorado, Kans. 2—Jim Jennings and Paul Meadors, independent operators, Tyler, Tex. 3—G. C. Walters, traffic manager, J. D. Wrather, president, and John Wrather, superintendent, Overton Refining Co. and Kilgore Refining Co. 4—Front row: George Bennett, driller, Harry Weber, Bovaird Supply Co., Lee Thompson, field carpenter, and C. O. Dillard, driller. Back row: Dan Kennedy, Bovaird Supply Co., Tom Bressler and Bill Shaffer, drillers, George Brink, salesman, Bovaird Supply Co., and U. Nocolet, driller, Borger, Tex. 5—J. P. Gillen and T. A. Hosey, Arrow Refining Co., Overton, Tex. 6—Shelton Hovis, George Walters, John Wrather, J. D. Wrather, E. J. Bartels, J. B. Wadley, Rex Stegal, G. A. Walter, Jr., Frank Skeels, J. H. Harrington, J. K. Park, owners and refining crew of the Overton Refining Co., Overton, Tex.



THE PURE OIL
PURE
COMPANY, U.S.A.

ASK US

. . . we have it!

If it's a petroleum product you want, Pure Oil can supply it—exactly to specifications. Complete producing, refining and transporting facilities assure uniform quality, economy, and delivery on the dot.

Just 'phone, wire or write nearest sales office. Pure Oil telegraph wires will flash your order and start this vast organization working for you.

The Company back of this advertisement can serve you well. Just ask any jobber who buys from Pure Oil.

REFINERIES:
Marcus Hook, Pa.
Cabin Creek Jct., W. Va.
Heath, Ohio
Ardmore, Okla.
Muskogee, Okla.
Smith's Bluff, Texas
Toledo, Ohio

SALES OFFICES:
Chicago
New York
Minneapolis
Philadelphia
Pittsburgh
Columbus, O.
Charleston, W. Va.
Norfolk, Va.
Atlanta, Ga.
Jacksonville, Fla.
Tampa, Fla.
Miami, Fla.
Pensacola, Fla.
Tulsa, Okla.
Beaumont, Texas

PURE

PRODUCERS, REFINERS, MARKETERS OF A COMPLETE LINE OF PETROLEUM PRODUCTS

THE PURE OIL COMPANY, U. S. A.

Put the "LF" on Your Pipe Line Engines

This efficient lubricator—built to stand up under the hardest usage—will go a long way towards assuring uninterrupted service from your Pipe Line Engines. In addition, the "LF" is almost uncanny in its accuracy, it will deliver any quantity of oil, from the fraction of a drop to a constant stream, and under any and all conditions.

There is no guesswork with the "LF"—your eye furnishes positive proof that oil in the right quantity is being delivered (every time a drop of oil passes through the sight feed the same quantity is delivered to the cylinder). Undetected leakage is impossible after the oil has passed through the sight feed.

Thoroughly investigate the advantages of the "LF" before you next purchase lubricators, either for replacement or new equipment.

McCord engineers—specialists in lubrication—are at your disposal and can render valuable assistance in the solution of your problems.

McCORD
RADIATOR & MFG. CO.
(LUBRICATOR DIVISION)
McCord also manufactures McKim Metallic Asbestos Gaskets widely used throughout the oil fields. Ask for catalog No. 17
DETROIT MICHIGAN

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 38)

Rellitt Oil Co.'s No. 1 Ganno hrs., 300 ft. S and E, NW cor. NW NE, Sec. 12-11-16 ..... Tested dry 1,965 ft; W.O.
Walters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 3-11-13 .... S.D. 1,266 ft.

LA SALLE PARISH

Gulf Ref. Co.'s No. 1 Tremont Lbr. Co., 668 ft. N, 632 ft. E, SW cor., Sec. 19-9n-2e ..... Drlg. 3,955 ft.

NATCHITOCHES PARISH

Cooper et al's No. 2-A Cooper, C SE SE, Sec. 32-11-10 .. S.D. 1,513 ft.
Mid-West Prod. Co., Inc.'s No. 1 H. Brown, Sec. 34-11-10, 200 ft. W, 330 ft. S, NE cor. SE ..... Derrick.
C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10 ..... Tested dry; S.D. 1,380 ft.

OUACHITA PARISH

Wilson & Mitchell's No. 1 Williams, Sec. 5-16-1e, 330 ft. E, 240 ft. S, NW cor. SW SE ..... Derrick.

RED RIVER PARISH

La. Oil Dev. Co.'s No. 2 La. Delta Pecan Co., 2,950 ft. S, 300 ft. E, NW cor., Sec. 27-13-11 ..... Spudded in; S.D. 50 ft.
Mack Jourden Co.'s No. 1 Lockett, 4,035 ft. S, 1,080 ft. E, NW cor. SW, Sec. 29, in Sec. 32-13-10 ..... S.D. 2,550 ft.

RICHLAND PARISH

Alto Gas Co.'s No. 2 Hunt, 660 ft. S and E, NW cor., Sec. 13-17-5 ..... Derrick.
National Gas Co.'s No. 1 Singletary, 1,980 ft. N, 660 ft. W, SE cor., Sec. 20-18n-7e ..... S.D. 2,515 ft.
Southern Carbon Co.'s No. 1-B C. M. Noble, 2,966 ft. N, 1,525 ft. W, cor. Secs. 7, 8, 17 and 18, in Sec. 37-15-6 .. Location.

SABINE PARISH

W. M. Coate's No. 1 Stille, 330 ft. N, 660 ft. W, SE cor., Sec. 35-8-13 ..... Derrick.
Diffie & Barnett's No. 1 Lites (was J. W. Clark's), 330 ft. N, 330 ft. W, SE cor. SW NW, Sec. 34-8-11 ..... S.D. 105 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 430 ft. S, 200 ft. W, NE cor. NW NW, Sec. 10-8-13 ..... S.D. for wtr. 3,753 ft.
W. M. Coates' No. 1-A Bowman-Hicks, 330 ft. S and E, NW cor. SW SW, Sec. 18-7-13 ..... Began Oct. 8; set 10-in. 100 ft; drlg. 1,225 ft.
Langbridge Oil Co.'s No. 1 Stephens, 330 ft. N and E, SW cor. SE NE, Sec. 17-9-11 ..... Testing 3,626 ft.
T. M. LeGrand's No. 1 Peterson, 330 ft. N and E of C, Sec. 34-7-13 ..... Drlg. 1,650 ft.
J. J. Keen, tr.'s No. 1 Belton (no check), Sec. 31-9-13 .. Arranging to deepen 1,720 ft.
A. H. Thames' No. 1 Edward est., 150 ft. NW SE cor. NE SE, Sec. 8-8-13 ..... S.D. for wtr. 1,200 ft.

TENSAS PARISH

U. A. Duvall et al's No. 1 Martin Jacob, 150 ft. S, 150 ft. W, NE cor., Sec. 1-14-11e ..... S.D. 2,775 ft.
A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... S.D. 3,545 ft.

UNION PARISH

Dan Brooks' No. 1 Odus Douglas, 330 ft. S and E, NW cor. NE SW, Sec. 9-22-2 ..... S.D. 3,509 ft.

VERNON PARISH

Exchange Pet. Co.'s No. 1 White & Grandin, Sec. 29-3n-7w, 1,980 ft. E, 1,430 ft. N, SW cor. Sec. ..... Coring 2,707 ft.

ARKANSAS

CHICOT COUNTY

R. R. Smith's No. 1 Lytle, 660 ft. N, 660 ft. E, C, Sec. 21-23-3 ..... T.A. 2,975 ft.

COLUMBIA COUNTY

Kendall Oil Co.'s No. 1 Fullenweider, Rhea & Kitchen, Sec. 13-17-22 ..... S.D. 804 ft.

CLAY COUNTY

S. C. Jeffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-3 ..... Drlg. 1,280 ft.

CLEVELAND COUNTY

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-12w .... Rigged up and S.D.

CLEBURNE COUNTY

(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9 ..... S.D. 3,740 ft.

CRAWFORD COUNTY

Ozark Nat. Gas Co.'s No. 1 Hammond, C SE SE, Sec. 29-10-29 ..... Drlg. shale 1,550 ft.

DALLAS COUNTY

E. C. Brewer's No. 1 W. E. Hillman, 330 ft. E, 40 ft. S, NW cor. SE NE, Sec. 20-10-13 ..... S.D; W.O. 2,869 ft.
J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 200 ft. S, 200 ft. E, NW cor. NE, Sec. 11-9-15 ..... S.D. funds 2,520 ft.
Zepp O. & G. Co.'s No. 2 Hillman, 450 ft. E, 340 ft. S, NW cor. SE NE, Sec. 10-20-13 ..... Set 6-in. 2,620 ft.

HOT SPRINGS COUNTY

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16 ..... S.D. 1,300 ft.

LINCOLN COUNTY

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 200 ft. W, NE cor. NE SW, Sec. 5-8-7 ..... Fishing D.S. 2,800 ft.

LITTLE RIVER COUNTY

Roberts Oil Co.'s No. 1 H. J. Russell, 330 ft. E, 330 ft. S, NW cor., Sec. 25-12-19 ..... Location.
Stephens et al's No. 1 Dierke Lbr. Co., Sec. 29-12s-31w, 150 ft. S, 330 ft. E, NW cor. NE NW ..... Derrick.

LOGAN COUNTY

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26 ..... S.D.; W.O. 3,570 ft.

MILLER COUNTY

W. E. Noel et al's No. 1 Dickson hrs., 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-20-27 ..... S.D. 1,955 ft.

OUACHITA COUNTY

Bolin & McLeon's No. 1 L. D. Nealy, 150 ft. S, 150 ft. W, NE cor. SE SW, Sec. 25-16-15 ..... 600 ft. oil in hole 2,112 ft; W.O. S.H.
Copenhaven et al's No. 2 Berg, C SE SE, Sec. 13-15-17 .. S.D. for funds 532 ft.
M. S. M. Oil Co.'s No. 4 Arnold & Doyle, Sec. 23-16-15, 200 ft. S and E, NW cor. SW SE ..... Rigging up.

PIKE COUNTY

E. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14 ..... T.A. 2,909 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24 ..... S.D; W.O. 1,020 ft.
E. R. Henderson's No. 1 W. B. East, 200 ft. S, 150 ft. W, NE cor., Sec. 13-9-23 ..... Arranging to set 8-in. to cut off wtr. 338 ft.

PRAIRIE COUNTY

Powell Creek O. & G. Co.'s No. 1 Kloss, NE SW, Sec. 3-4n-6w ..... Rigging up.

SCOTT COUNTY

Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26 ..... S.D; T.D. 1,436 ft.
Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29 ..... S.D; waiting on csg. 1,860 ft.

UNION COUNTY

Chapman & Wilson's No. 1 A. H. Hadley, 330 ft. N, 330 ft. E, SW cor. NE SW, Sec. 3-18-13 ..... Completed 55 bbls. fluid, 14% S. W. 3,570 ft.
Drillers Oil & Dev. Co.'s No. 1 Pickering, 220 ft. N, 668 ft. E, SW cor. NW NE, Sec. 1-17-16 ..... Drlg. gummy lime 1,740 ft.
H. H. Helms' No. 1 C. H. Murphy, NE cor. NW NE, Sec. 31-16-14 ..... Moving in rig.
Sunby et al's No. 2 Perdue, Sec. 33-16-14, 75 ft. S, 150 ft. E, NW cor. Sec. ..... Old well; arranging to sidetrack D.S. at 3,247 ft. and deepen.
Joe Modisette et al's No. 1 W. D. Webb, Sec. 6-18-13, NE cor. NW SE ..... Rigging up.

An organization engaged exclusively in refinery engineering, which executes its undertakings in minimum time and in workmanlike manner.

Refineries in whole or in part designed and erected.

Long commercial experience in the production of high anti-knock gasolines from any crude oils.

Ask any Winkler-Koch user.

THE WINKLER-KOCH ENGINEERING COMPANY

Consulting and Construction Engineers

WICHITA, KANSAS

L. D. 232

Eastern Representative:
FRANK DeGANAHL,
5836 Grand Central Terminal Bldg.,
New York City.

European Representative:
A. F. CRAIG & COMPANY, LTD.,
Paisley, Scotland
London, England.

WASHINGTON COUNTY
(Cable tools)

C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... S.D. for funds 1,795 ft.

YELL COUNTY
(Cable tools)

Tegmeir & Luckett's No. 1 Falcon, Sec. 36-7-21 ..... S.D. 5,710 ft.

EAST TEXAS
BOWIE COUNTY

Hindeman & Bell's No. 1 Merritt (was Maud-Redwater Oil Co.'s), 175 ft. N, 175 ft. E, SE cor. G. W. Hardidge 100-ac. tr. on Floyd Merritt tr. in Y. S. McKinney Sur. ..... Coring 3,280 ft.
Logan & Elliott's No. 1 Smith, 9,600 ft. S, 2,500 ft. W, NE cor. Chas. Lewis Sur. ..... S.D. 4,505 ft.
Tarkington & Jones' No. 1 W. W. Whybark, 200 ft. S, 200 ft. W, SW cor. J. H. Dyer Sur. ..... Drlg. sandy lime 1,300 ft.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... S.D. 3,000 ft.

CAMP COUNTY

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr. in J. H. Murphy Sur. ..... S.D. 3,600 ft.

CASS COUNTY

J. F. Morrisey's No. 1 T. J. Wilson, 1,088 ft. S of N line, 2,376 ft. E of W line of H.R.S., J. R. McFarland Sur. ..... S.D. 3,670 ft.
Davis & Pigg's No. 1 Roy Brian, SW cor. Roy Bryan 88-ac. tr., Albert H. Latimer Sur. ..... S.D. 2,055 ft.
Everets Drlg. Co.'s No. 1 H. W. Whittington, 200 ft. S and W, NE cor. 69-ac. Whittington tr., L Strong Sur. ..... S.D. 3,922 ft.
Geo. McKamie's No. 1 R. E. Hall, 150 ft. N, 150 ft. W, SE cor. Hall's 117-ac. tr., H. Buckler Sur. ..... S.D. 4,195 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ..... S.D. 4,390 ft.
Olds & Smith's No. 1 Athens, 3,056 ft. W-E line, 856 ft. S-N line, J. C. Byers Sur. ..... Dry and abd. 3,656 ft.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. .... S.D. 2,280 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ..... S.D. 955 ft.
United North & South Co.'s No. 1-A Nickelberry, W. A. Irvin Sur., 300 ft. S and E, NW cor., Nickelberry 50-ac. tr. ..... Drlg. chalk 2,690 ft.

HARRISON COUNTY

Lloyd Oil Corp.'s No. 1 E. S. Timmons, 150 ft. from N line to 250 ft. from E line of 105-ac. tr., Findley Sur. ..... S.D. 3,432 ft.
Ryan Consolidated Pet. Corp.'s No. 1 J. M. Fuhr, 1,300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur. .. Derrick.

MARION COUNTY

Gist, Claunch & Dodson's No. 1 Miller, 1,470 ft. E line, 725 ft. N line, SW cor. H. Fulgran H.R. Sur. ..... S.D. 300 ft.
Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 3,555 ft. E most easterly W line, Alexander Albright Sur. ..... S.D. 2,380 ft.

PANOLA COUNTY

Hoffer et al's No. 1 Cameron Lbr. Co., center 1,306-ac. tr. in W. M. A. LaGrove Sur. ..... Derrick.
Moses & Wallace's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur. .. Spudded and S.D.
G. A. Davidson's No. 1 Latham, Wm. Rich Sur. ..... S.D; changing to heavy rig 550 ft.
J. L. Nelson et al's No. 1 J. W. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in Jas. Hanks Sur. ..... S.D. 2,250 ft.
United Gas Public Service Co.'s No. 11 Werner, 1,162 ft. N, 2,418 ft. W, SE cor. D. B. Lewis Sur. ..... Drlg. hard lime 3,863 ft.

RED RIVER COUNTY

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. .... S.D. 2,795 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur. ..... S.D. 2,280 ft.

SHELBY COUNTY

I. M. Bradley's No. 1 Ashberry (no check), G. W. Mitchell Sur. ..... S.D. 3,280 ft.
E. L. Chapman's No. 1 Pickering Lbr. Co., C. E. Henry (headright) ..... Reaming to bottom 3,620 ft; T.D. 3,864 ft.
Chapperell Oil Co.'s No. 2 Holt, Matthew Moore Sur. .. S.D. 3,127 ft.
K. H. Francis' No. 1 John Mims, Mary Smith Sur. ..... Drlg. 2,160 ft.
H. H. Gracey's No. 1 J. A. Morrison, 1,500 ft. N, 200 ft. E, SW cor. J. A. Morris' 109-ac. tr., Wm. English Sur. ..... S.D. 2,600 ft.
Henry Maulding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 80-ac. tr., A. D. Fountain Sur. ..... Drlg. 3,315 ft.
McRoby et al's No. 1 Windham, Wm. Leach Sur., on Windham 296-ac. tr. ..... Bailed dry 2,282 ft; arranging to deepen.
Ridgeway et al's No. 1 Polley, Domingo Gonzales Sur., 3,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-ac. tr. ..... S.D. 405 ft.
Schultz et al's No. 1 Hughes, 150 ft. SW cor. Hughes' 110-ac. tr., J. Clay Sur. ..... Dry and abd. 4,808 ft.
A. D. Smith's No. 1 Y. D. Carroll-J. A. Parker Sur., 1,500 ft. N, 300 ft. W, SE cor. J. A. Carroll Sur. ... S.D. 3,240 ft.
C. H. Tautenhahn's No. 1 J. C. Bogard, 300 ft. S, 900 ft. E, NW cor. J. C. Bogard's 52-ac. tr., Thomas Baker Sur. ..... S.D. 20 ft; waiting on D.S.
Tenant et al's No. 1 J. Henry, C. Z. Walker Sur. ..... S.D. 3,457 ft.
United North & South Prod. Co.'s No. 1 Windham, 800 ft. W, 1,050 ft. N, SE cor. of Windham 171.5-ac. tr. on A. H. English Sur. ..... Rigging up.

LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 38)

United Gas Public Service Co.'s No. 5 Earle, Sec. 25-17-5e, 1,980 ft. E, 1,320 ft. S, NW cor. ..... Set 13-in. 158 ft; set 8-in. 870 ft.
United Gas Public Service Co.'s No. 1 Faust, Sec. 13-17-5e, 320 ft. W, 600 ft. N, SE cor. ..... Set 8-in. 917 ft; drlg. 1,642 ft.

SABINE PARISH—ZWOLLE

O. J. Baird's No. 1 Duggan, Sec. 14-7-11, 328 ft. S, 648 ft. E, from center of Sec. ..... Derrick.
Roy Baker's No. 1 Sabine Lbr. Co., Sec. 1-7-12 ..... W.O.S.R. 2,548 ft.
W. M. Coates' No. 1 Bowman-Hicks, 330 ft. S and W, of C, Sec. 2-7-12 ..... W.O.S.R. 2,441 ft.
W. M. Coates' No. 1-B Sabine Lbr. Co., 150 ft. N and E, SW cor. NW NW, Sec. 1-7-12 ..... W.O.S.R. 2,306 ft.
W. M. Coates' No. 2 Hale, 330 ft. S and E, NW cor. SW NE, Sec. 1-7-13 ..... Set 10-in. 100 ft; set 6-in. 2,097 ft.
Crescent Drilling Co.'s No. 1 Byrd, Sec. 13-7-11 ..... Drlg. 1,800 ft.
Dengail O. & G. Co.'s No. 3 Nulton, 330 ft. N and E, SW cor. NW NE, Sec. 1-7-13 ..... Derrick.
Hawkins et al's No. 1 Moran, Sec. 1-7-11 ..... Completed Oct. 8; 25 bbls. 2,620 ft.
O. A. Gautier et al's No. 1 Mischell, 330 ft. E, 150 ft. N, SW cor. SE NW, Sec. 30-8-12 ..... S.D; W.O. 2,532 ft.
Hawkins & Antoon's No. 1 Newton, Sec. 1-7-11 ..... W.O.S.R. 2,600 ft.
Hudson & Bird's No. 1 Walden, 450 ft. N, 300 ft. E, SW cor. SW NE, Sec. 26-8-11 ..... S.D. 1,800 ft.
Lanier & Dyer's No. 1 Barthold, 325 ft. N, 525 ft. E, SW cor. SE NE, Sec. 25-8-12 ..... W.O.S.R.; 1,600 ft. oil in hole 2,521 ft.
Zeke Lohman's No. 1 McCormick, 660 ft. E, 330 ft. N, SW cor. NE SW, Sec. 2-7-11 ..... S.D. 1,606 ft.
Loring Oil Co.'s No. 18 Bowman-Hicks, 1,280 ft. S, 275 ft. E, NW cor. SW NW, Sec. 15-7-12 ..... Drlg. shale 2,700 ft.
Loring Oil Co.'s No. 19 Bowman-Hicks, 1,475 ft. W, 75 ft. S, NE cor. SW NE, Sec. 16-7-12 ..... Dry and abd. 2,975 ft.
Lyons & Neely's No. 3 Byrd, Sec. 1-7-11 ..... S.D. 400 ft.
L. K. McGuffin's No. 1 Bush, NW cor. NW SE, Sec. 1-7-11 ..... S.D. 400 ft.
Ben Merritt, tr.'s No. 2 Byrd, Sec. 1-7-11 ..... S.D. 88 ft.
Ohio Oil Co.'s No. 12 Bowman-Hicks, Sec. 2-7-12, 150 ft. N and W, SE cor. NE NE ..... Rigging up.
H. W. Perritt's No. 5 Bowman-Hicks, 330 ft. S, 410 ft. E, NW cor. SW SW, Sec. 2-7-12 ..... Tested dry 2,317 ft; arranging to deepen.
Eddie Self's No. 2 Jacob, Sec. 1-7-11 ..... S.D. for wtr. 1,340 ft.
Stovall, tr.'s No. 2 Nulton, 241 ft. N, 330 ft. W, SE cor. NE NW, Sec. 1-7-13 ..... Began Oct. 8; set 10-in. 102 ft; drlg. 900 ft.

UNION PARISH

Interstate Nat. Gas Co.'s No. 27-C Howard, 660 ft. S and E, from C, Sec. 32-20-3e ..... Began Oct. 10; drlg. 150 ft.
Stovall Gas Co.'s No. 2 Howard, Sec. 32-20-3e, 1,320 ft. S, 1,980 ft. W, NE cor. ..... Rigging up.

ARKANSAS
UNION COUNTY—EL DORADO

Lion O. & R. Co.'s No. 9-A G. P. Hayes, 242 ft. S, 246 ft. W, NE cor. Lot 5, NE, Sec. 4-16-15 ..... Drlg. hard gray lime 5,930 ft.
Southern Prod. Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 ..... Arranging to resume drlg.

UNION COUNTY—URBANA

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. 8½ NW, Sec. 11-18-13 ..... T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13 ..... Location.
Wilson & Chapman's No. 1 H. Norman, 330 ft. N and E, SW cor. SE NE, Sec. 3-18-13 ..... Completed 1,400 bbls. 3,583 ft.
Wilson & Chapman's No. 1-B Hadley, Sec. 3-18-13, 660 ft. N, 225 ft. W, SE NW ..... Derrick.

EAST TEXAS
PANOLA COUNTY

Daisy O. & G. Co.'s No. 1 Rucks, Jno. Palmer Sur. ..... S.D. 3,270 ft.
Dillon & Braham's (was W. G. Banks et al's) No. 1 C. O. Baldwin, 1,395 ft. W, 1,362 ft. S, NE cor. Baldwin 290 ac. in Hampton West Sur. ..... S.D. 1,555 ft.
Nat. Gas Prod. Co.'s No. 2 Floyd, 50 ft. S and 100 ft. W from No. 1 Floyd, Ben C. Jordan Sur. ..... Location.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur. .. Location.
Southwestern O. & G. Co.'s No. 1 E. R. Vinson, 3,005 ft. S, 1,001 ft. W, NE cor. C. T. Anderson Sur. .... S.D. 2,650 ft.

MISSISSIPPI
HINDS COUNTY

Jackson O. & G. Corp.'s No. 2 Mayes, Sec. 2-5n-1e, 30 ft. N and 60 ft. W of SE cor. NE NW ..... Dry and abd. 2,518 ft.
Love Pet. Co.'s No. 1 Federal Compress & Warehouse Co., Sec. 15-5n-1e, 662 ft. S and 2,120 ft. E, NW cor. . Set 6⅝-in. 2,441 ft.
Millsaps College's No. 1 fee, Sec. 34-6n-1e, 2,225 ft. N, 1,412 ft. W, SE cor. Sec. ..... Location.

RANKIN COUNTY

James Alexander, tr.'s No. 1 Wright Cast Stone Co., 200 ft. S, 1,460 ft. NE cor. NE NW, Sec. 13-5n-1e ..... Set 6⅝-in. 2,392 ft.
Cummins & Montgomery's No. 1 Ivey, Sec. 13-5n-1e, NE Lot 10, Blk. D, E. Jackson Pl., first addn. .... Derrick pattern.
J. E. Grandstaff et al's No. 1 Burford, 2,210 ft. E, 800 ft. N, SW cor., Sec. 11-5n-1e ..... Completed, estimated 35,000,000 ft. gas 2,454 ft.
J. E. Grandstaff et al's No. 1 East, Sec. 12-5n-1e, 1,180 ft. W and 515 ft. N, SE SW ..... Set 10-in. 100 ft; drlg. 685 ft.
Orr's No. 1 Casey, Sec. 12-5n-1e, 540 ft. E and 1,920 ft. S, NW cor. SW t ..... Drlg. 1,360 ft.

WILDCAT OPERATIONS IN MISSISSIPPI

ADAMS COUNTY

Company, farm and location—	Remarks:
Ark-La. P. L. Co.'s No. 1 Brandon Hall Farms, 201 ft. from W line, 390 ft. from S line, Lot 32, Brandon Subd., Sec. 61-18n-1w	Dry and abd. 4,510 ft.

CLARKE COUNTY

Gulf Ref. Co.'s No. 1-A Long Bell Lbr. Co., C SW SW, Sec. 16-2n-16w ..... Set 6⅝-in. 3,675 ft.

HINDS COUNTY

Hilgard Gas Co.'s No. 1 The Mississippi Co., Sec. 4-5n-1e, 1,300 ft. E and 450 ft. N of cen. of Sec. ..... Drlg. 200 ft.
Howard Oil Co.'s No. 1 Jackson College, C NW NW, Sec. 9-5-1e ..... S.D. 74 ft.
Southern Pet. Co.'s No. 1 Wilson (was Tri-State O. & G. Co.'s), 320 ft. E, 240 ft. N, SW cor. SE NE, Sec. 28-6-1e ..... S.D. 20 ft; W.O.
F. E. Stewart et al's No. 1 Miss. Cotton Seed Products Co., Sec. 4-5n-1e, 320 ft. S and 440 ft. W of NE cor. SE ..... Derrick.

HUMPHREYS COUNTY

Danciger O. & G. Co.'s No. 1 Belgrade Lbr. Co., C NW, Sec. 29-14n-4w ..... Fishing for D.S. 2,080 ft.

JASPER COUNTY

Bay Springs Pet. Co.'s No. 1 Keyes, C NW NE, Sec. 2-12-9 ..... S.D. 2,360 ft.

MONROE COUNTY

Amory Dev. Co.'s No. 1 Bourland, Sec. 2-13-19 ..... S.D. 3,015 ft.
McAlpine et al's No. 1 Cowart, second hole, Sec. 2-12-19 .. Drlg. 3,493 ft.

NEWTON COUNTY

Bob Dalton's No. 1 Majure, 400 ft. N, 300 ft. E of SW cor. SE, Sec. 25-6n-11e ..... Set 10-in. 295 ft.

NOXUBEE COUNTY

Thompson & Donohue's No. 1 Donohue, Sec. 25-16n-17e .. Set 8-in. 1,605 ft; T.D. 1,715 ft.

RANKIN COUNTY

Attkisson & Dyer's No. 1 Valentour, 200 ft. S, 200 ft. E, NW cor., Sec. 18-5n-2e ..... S.D. 1,224 ft.
Gulf Ref. Co.'s No. 1-A Hanna, Sec. 23-6n-1e ..... Drlg. 1,390 ft.
Majestic O. & G. Co.'s No. 1 Elton Lbr. Co., Sec. 10-4n-3e. Derrick.
Meredith et al's No. 1 Allen, 470 ft. W, 295 ft. N, SE cor. SW, Sec. 12-5n-1e ..... Completed 30,708,000 ft. gas 2,375 ft.
Square Deal O. & G. Co.'s No. 1 Spann, NW cor. SE NE, Sec. 13-5n-1e ..... S.D. 2,495 ft.
United Gas Public Service Co.'s No. 1-A McLaurin, 3,950 ft. E, 660 ft. S, NW cor. SW, Sec. 3-5n-2e ..... Testing 2,528 ft.
Willis & Culley's No. 1 Applewhite & Holden, 10 ft. N, 60 ft. E, SW cor., Sec. 12-5n-1e ..... Drlg. 2,160 ft.

SCOTT COUNTY

M. U. Culley et al's No. 1 Owens, Sec. 2-8-9 ..... Derrick.

WARREN COUNTY

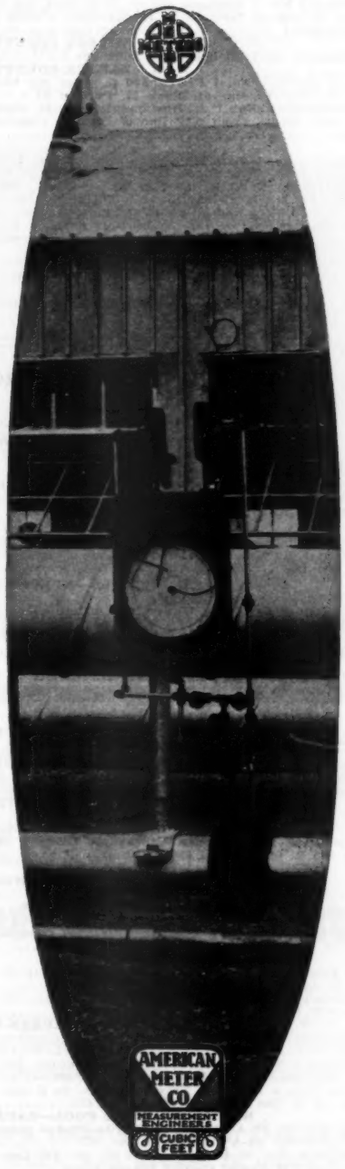
Eagle Bend O. & G. Co.'s No. 1 Kiger, SW cor. SW SE, Sec. 9-18-2 ..... S.D. 2,607 ft.
United Gas Public Service Co.'s No. 1 Tchula Co-Operative Store, 1,980 ft. W, 660 ft. N, SE cor. SE, Sec. 32-15n-3e ..... Coring 2,274 ft.

WEBSTER COUNTY

P. J. McAlpine's No. 1 Henly (was Cumberland Oil Co.'s No. 1 Henly), SE NW, Sec. 15-21n-11e ..... S.D. 1,800 ft.

WINSTON COUNTY

Miss. Drlg. Co.'s No. 1 Scarbrough, NW cor., Sec. 15-12-14 ..... Reaming to bottom 4,007 ft.



A Westcott Orifice Meter installed on fuel manifold at compressor station of a large repressuring system in Texas.

Faithfully Accurate for Difficult Service

At natural gasoline plants, or at compressing and measuring stations, Orifice Meters are subjected to real tests of merit; and Westcott correct design and rugged construction consistently *pass* these tests, for simplicity and ruggedness are attained without sacrificing precision and permanence of calibration. This applies, of course, to each Westcott installation as a whole, including the accurately machined and honed Metric Orifice Discs.

Westcott Orifice Meters even pass the test of location close to intake of compressor plants, where pulsation and accumulation of liquids in collecting mains often combine to make the most difficult of service conditions. The Westcott combination of large float area with long float lever arm provides powerful leverage and makes possible a long pen arm with a small-angle motion, resulting in sensitive, non-sticking, positive response of the recording pen, no matter how severe the service may be.

Not only is the Westcott Orifice Meter an *instrument* of high precision under normal conditions;—it is also heavy-duty equipment—designed and built for actual, day-in and day-out plant and station service, taking conditions as they come.

METRIC METAL WORKS
ERIE, PENNSYLVANIA
Showcase, Tinned Steel Case and Orifice Meters

AMERICAN METER COMPANY
INCORPORATED
The World's Largest Manufacturers of Gas Meters and Allied Apparatus
ESTABLISHED 1836

SALES . . . ERIE - DALLAS - TULSA - DENVER - LOS ANGELES - SAN FRANCISCO - KANSAS CITY - BIRMINGHAM
SERVICE . . . PITTSBURGH - CHICAGO - PHILADELPHIA - NEW YORK - BALTIMORE - BOSTON - ALBANY - HOUSTON

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 43)

Moore-Jaurer's No. 1 Ellison, 2,916 ft. from E line, 1,500 ft. from S line of T. York Sur.....T. D. 2,170 ft.; abnd.
Schneider, Rees et al's No. 2 Claussen, 12 miles NE of San Antonio .....T. D. 865 ft.; standing.
Tri-State Oil Co.'s No. 1 E. B. Carruth, 2,500 ft. from S line, 2,560 ft. from E line of tract in F. Bolen Sur..T. D. 770 ft.; set 10-in. csg.

CALDWELL COUNTY

Ralph Ogden's No. 1 Nealson, 150 ft. from N and E lines of farm in John B. Gray Sur. .....Derrick.
Ralph R. Lewis' No. 1 Keith McGee, 600 ft. from E and S lines of tract in J. Pinchback Sur.....T. D. 50 ft.; laying water line.

COMAL COUNTY

Caldwell & Lanier's No. 1 T. J. Byler, 175 varas from W line, 370 varas from N line of 320-ac. tract in the H.E.&W.T. No. 5,894 Sur.....T. D. 722 ft.; standing.

DEWITT COUNTY

Gibson & Sturm's No. 1 Clark, Dolores Alderete Sur.....Rigged up; standing.

DUVAL COUNTY

Thomas & Tarver, Inc.'s No. 1 Wood-Welder, 500 ft. to N line, 4,230 ft. to W line of Sur. No. 102 .....Location.
S. J. Carpenter et al's No. 1 Juan Benavides, Blk. 33, Mesquite grant .....T. D. 1,712 ft.; standing.
Frank Gravis' No. 1 Shallert, Sur. No. 255.....T. D. 1,450 ft.; shut down.
South Texas Production Co.'s No. 1 Benavides, 330 ft to N and E lines of Sur. 173 .....T. D. 2,451 ft.; set csg., waiting on cement.

FRIO COUNTY

A. H. Wray's No. 1 Roche, 330 ft. from N and W lines of NW SE, Sec. 123, A. Hutzler Sur.....T. D. 2,404 ft.; drlg.

GUADALUPE COUNTY

Barnhill et al's No. 1 H. L. Hoffman, 456 ft. to N and W lines of farm in John G. King Sur. .....Derrick.
Boiling et al's No. 1 J. E. Lennie, 850 ft. from E line, 1,050 ft. from S line of farm in V. Cortario Survey..Rigging up.
Harry Bruner's No. 2 Jim Sherrill, 330 ft. from NW and SW lines of tract in George Allen League.....T. D. 180 ft.; standing.
McGarrity et al's No. 1 A. Wesch, Jr., 150 ft. to N and E lines of farm, H. M. Thompson Sur.....T. D. 1,200 ft.; standing.
Schleyer, Atherton and Armstrong's No. 1 Ogletree, Robert Smith Sur. .....T. D. 1,745 ft.; shut down.

GOLIAD COUNTY

Plymouth Oil Co.'s No. 1 Parks, 5 miles NE Goliad .....Derrick.
Camp and Stanolind's No. 2 Pettus, 1,589 ft. N, 63 degrees 46½ minutes W of No. 1 .....T. D. 3,560 ft.; drlg.

HAYS COUNTY

J. C. Jones et al's No. 1 Byder, John Ingram Sur.....T. D. 930 ft.; standing.

JIM HOGG COUNTY

Cole Petroleum Co.'s (Peterman-Minahan) No. 1 Palacious, 450 ft. from W line, 150 ft. from N line of Blk. 14, Sur. 231.....T. D. 2,340 ft.; drlg.

JIM WELLS COUNTY

Stanolind Oil & Gas Co.'s No. 1 N. A. Hoffman, 6,800 ft. from S line, 10,000 ft. from W line of most easterly NE cor. of 7,000-ac. ranch in La Trinidad Sur.....T. D. 3,510 ft.; drlg.

KENDALL COUNTY

Borgett et al's No. 1 W. Haag, 3,804 ft. from N line, 1,506 ft. from W line of W. Avery Sur.....T. D. 1,245 ft.; shut down.
Dixon Oil Co.'s No. 1 Ottmar Behr, 823 ft. from S and N lines of Jessie Wilson Sur., 3 miles S of Sisterdale .....T. D. 2,708 ft.; standing.
Sitton et al's No. 1 Garvin, C of NE of D. L. Richardson Sur. in the D. L. Richardson Sur., 1 mile NE from Kendalia .....T. D. 1,482 ft.; shut down.
Fred S. Dibble's No. 1 Eilebrach, Sur. 77, N part of county .....T. D. 50 ft.; shut down.
Sartain's No. 1 Lawhon, 30 ft. SE of Perkins' No. 1 Lawhon; taken over at 281 ft.....T. D. 575 ft.; no report.

KERR COUNTY

Herbert Oil Co.'s No. 1 J. D. Witt, 1,320 ft. N line, 1,320 ft. W line of Sec. 1,922, W. H. Hamilton Sur....T. D. 200 ft.; standing.
Evans & Gant's No. 1 Selker-Mears, C,C,S.D.&N.G.R.G. Sur. No. 1,605.....T. D. 4,031 ft.; shut down.
Evans & Gant's No. 1 E. Young, A. E. Burge Sur. No. 28 .....T. D. 1,312 ft.; standing.
Evans & Gant's No. 2 Love, 150 ft. S and W line of Sur. 1,593 .....T. D. 3,260 ft.; resumed drlg.

KARNES COUNTY

V. F. Neuhaus' No. 1 Russell, 150 ft. to E line, 150 ft. N of Highway, in Carlos Martinez Sur. .....Rigging up.
United North & South's No. 1 Morrell, 330 ft. from W line, 990 ft. from S line of tract in Carlos Martines Sur. .....Location.

LASALLE COUNTY

Buckley Ranch Oil & Gas Co.'s No. 1 Buckley, 300 ft. from S line, 330 ft. from W line of Sur. No. 37.....T. D. 2,180 ft.; drlg.

LIVE OAK COUNTY

Henderson Coquat's No. 1 Hewitt.....T. D. 400 ft.; standing.

LEE COUNTY

A. H. Wheeler and associates' No. 1 fee, Blk. 47, H. Donohue Sur. .....T. D. 3,525 ft.; shut down.
C. B. Polk et al's No. 1 Stoltz, Hiram Dononue Sur.....T. D. 2,300 ft.; shut down.

MAVERICK COUNTY

I. N. Boicourt's No. 1 Bandera School Land.....T. D. 2,284 ft.; standing.

McMULLEN COUNTY

Whall, Scherer et al's No. 1 Shiner, Henry Brewer Sur....T. D. 2,008 ft.; shut down.
A. E. Adams' No. 1 Martin, 150 ft. NW line, 150 ft. to SW line of E. Melon No. 212 Sur.....T. D. 700 ft.; no report.

MEDINA COUNTY

Frank A. Brown's No. 1 Fohn, 150 ft. from E line, 790 ft. from N line of J. F. Torry Sur. No. 113.....T. D. 922 ft.; twisted off drill stem; fishing.
Genard Bros.' No. 1 L. Crawford, 150 ft. to N and W lines of tract in J. Keppler Sur. No. 478.....T. D. 2,145 ft.; drlg.
J. H. Hickey's No. 1 Jungman, at N end Chicon Lake....T. D. 650 ft.; shut down.
Star Pet. Co.'s No. 1 Medina Valley Irrigation Co., 150 ft. from S and E lines of Isom Palmer Sur. No. 20...T. D. 825 ft.; shut down.

MILAM COUNTY

Dil-Tex Oil Corp.'s No. 1 E. Lawson, 560 ft. from NE and 370 ft. from SE lines of farm in Fernando Rodrigues Sur., near Cause.....T. D. 1,960 ft.; standing.
H. W. Elliott's No. 1 Marek, 767 ft. from N line, 500 ft. from W line of 160-ac. tract in B. Wickson Sur.....T. D. 1,295 ft.; shut down.
Nowlen's No. 1 Beard, 1,350 ft. from SE line, 450 ft. from SW line of farm, in J. F. Guthrie Sur., 4 miles S Thorndale .....T. D. 2,036 ft.; drlg.
Red Bank Oil Co.'s No. 1 Foster, A. G. Berry Sur.....T. D. 4,875 ft.; fishing.

NUECES COUNTY

Southern Crude Oil Pur. Co.'s No. 1 Chas. E. Stratton, 1,650 ft. E line, 330 ft. S line of P. Sancho Sur.....T. D. 4,765 ft.; testing.

REAL COUNTY

McGinley Corp.'s No. 1 Haby, C of SW, Sec. 175.....T. D. 2,530 ft.; shut down.

TRAVIS COUNTY

Bass & Speed's No. 1 Joe F. Nagle, 750 ft. from SW line, 450 ft. from NW line of farm in L. Kimbro Sur..Rigging up.
C. R. Franklin et al's No. 1 J. Wilson, 160 ft. from N and W lines of farm in A. Alexander Sur.....T. D. 495 ft.; drlg.
Fritz Fuchs' No. 1 L. Ballerstedt, 450 ft. from N line, 750 ft. from E line of tract in Amos Alexander Sur...T. D. 1,200 ft.; no report.
Ray & Hense's No. 1 Hatech, in C of tract in S. Hamilton Sur. .....T. D. 360 ft.; no report.
Waldron et al's No. 1 T. Cook, 900 ft. from NW line, 3,500 ft. from SW line of D. H. Minor Sur.....T. D. 1,200 ft.; no report.

WEBB COUNTY

O. W. Killam's No. 3 Bruni, 9,195 ft. to NE line, 6,890 ft. to SE line of tract in Borrego grant .....T. D. 300 ft.; drlg.
Newton, Owens & Evans' No. 1 Garza, 200 ft. to N line, 200 ft. to W line of Blk. 4, Share 1, Survey 161 .....Location.
Power & Dettenhaim's No. 1 Cowan & Goss, 1,870 ft. from W line, 1,656 ft. from N line of Sur. No. 1,606..T. D. 150 ft.; drlg.
Winfield Killam No. 1 Killam, Block 18, Survey 1,618 near Reiser .....T. D. 1,475 ft.; drlg.
Cole Pet. Co.'s No. 4 Benavides, 2,480 ft. to E line, 160 ft to S line of Sur. No. 1,613 .....T. D. 4,050 ft.; shut down.
E. A. Sterling & Co.'s No. 1 de la Garza, 150 ft. from N and W lines of Block 30, Survey No. 336 .....T. D. 1,300 ft.; drlg.

WILLIAMSON COUNTY

Hays & Gee's No. 1 E. G. Johnson, 1,800 ft. from N line, 170 ft. from E line of tract in B. C. Low Sur., S of Georgetown.....T. D. 1,325 ft.; hole cleaned.
H. Fritz' No. 3 Fee, 35 ft. N of No. 1 Fee.....T. D. 1,100 ft.; drlg.
McLean's No. 1 R. C. Miller, 300 ft. from S line, 150 ft. from W line of farm in Maniove Sur.....T. D. 1,670 ft. sidetracking.
Nowsman et al's No. 1 Cruse, 500 ft. to NW line, 150 ft. to NE line of farm in H. W. Eubank Sur. .....T. D. 30 ft.; spudded in.
R. B. Wilson's No. 1 Speckels, 150 ft. N of road, 600 ft. from W line of farm in J. Jordan Sur., 1 mile N of Coupland .....Shut down 875 ft.

WILSON COUNTY

A. M. Blume's No. 1 Nickolson, C. Diaz Sur.....T. D. 1,360 ft.; drlg.

ZAPATA COUNTY

Ballard & Mercer's No. 1 Flores, 500 ft. from NE line, 530 ft. from SE line of Block 27, Porcion 37 .....Location.
F. H. Etheridge's No. 1 J. Bustamente, 640 ft. from NE line, 150 ft. from NW line of farm in Comitas grant .....T. D. about 1,500 ft.; flowed on drill stem test.
M. D. Slator's No. 1 Slator, 1,000 ft. from SE line, 1,200 ft. from SW line of Block 25, J. V. Borrego grant...T. D. 927 ft.; drlg.
F. H. Etheridge's No. 1 Henne-Winch, in Sur. No. 286...T. D. 1,900 ft.; drlg.
T. H. Ward's No. 1 Uribe, 150 ft. NW line, 150 ft. SW line, Blk. 8 Subd., Share 7, Partition No. 6, T. Uribe Partition of Jose V. Borrego Sur.....Rigged up and standing.
Bill Henry et al's No. 1 Gopher Trust estate, Borrego grant .....T. D. 1,525 ft.; standing.
National Oil Co.'s No. 1 Zapata Trust estate, 617 ft. NW line, 96 ft. NE line, Blk. 97, De Prom Subd., Porcion 6 .....T. D. 600 ft.; standing.
National Oil Co.'s No. 2 Adams, 150 ft. from NW line and SW line, Blk. 11, Borrego grant.....T. D. 1,320 ft.; standing.

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 43)

CARTWRIGHT POOL—LIVE OAK COUNTY

Houston Oil Co.'s No. 14 Cartwright, 1,000 ft. W of No. 23 Cartwright.....T. D. 5,400 ft.; standing.

CHITTIM POOL—MAVERICK COUNTY

Texas Gas Utilities' No. 8 Chittim, 24 ft. S of No. 7 Chittim .....T. D. 4,810 ft.; shut down.

TAYLOR FIELD—MEDINA COUNTY

Medina Oil & Refining Co.'s No. 2 R. T. Taylor, 1,700 ft. from N line, 1,050 ft. from E line of Bruchet Sur. No. 135 .....T. D. 350 ft.; complete 5 bbls.

SAXET FIELD—NUECES COUNTY

Gulf Coast Oil Co.'s No. 1 Sagarin.....T. D. 4,085 ft.; drlg.
Gulf Coast Oil Co.'s No. 1 Elder, NW of same company's No. 1 Harrell.....T. D. 4,793 ft.; drlg.
Neal-Milton and Kepley Pet. Co.'s No. 1 J. N. Roark, 200 ft. to S line, 200 ft. to E line of 100-ac. tract.....T. D. 4,836 ft.; flowed through drill stem in 15 min.
Saxet Oil Co.'s No. 1 McCampbell, 600 ft. from N and 1,900 ft. to W lines of tract .....T. D. 2,545 ft.; drlg.
Southern Drilling Co.'s No. 1 Alexander, 200 ft. to S line, 150 ft. to E line of farm .....T. D. 4,400 ft.; drlg.

SINTON POOL—SAN PATRICIO COUNTY

Welder Oil Corp.'s No. 3 Welder, 800 feet NE of No. 2...T. D. 1,500 ft.; drlg.

WELDER FIELD—SAN PATRICIO COUNTY

Welder Oil Corp.'s No. 3 Welder 800 ft. NE of No. 2 Welder .....T. D. 3,671 ft.; set csg.

WHITE POINT POOL—SAN PATRICIO COUNTY

Saxet Oil Co.'s No. 18 Rachel .....Rigging up.

LOS OLMOS POOL—STARR COUNTY

Los Olmos Oil & Gas Co.'s No. 1 Seabury, 1,800 ft. to S line 175 ft. to E line of 686-ac. tract in Porcion 75..T. D. 366 ft.; set csg., waiting on cement.

CAROLINA-TEXAS POOL—WEBB COUNTY

Carolina-Texas Oil & Gas Co.'s No. 10 Barnsley, 150 ft. to E line, 200 ft. to S line of Blk. 14, Sur. 268 ....Location.

COLE POOL—WEBB COUNTY

French Oil Corp.'s No. 4 R. Benavides, 1,945 ft. from N line, 150 ft. from W line of Sur. 659.....T. A. 2,330 ft.; standing 1,600 ft. in oil.
Magnolia Petroleum Co.'s No. 5 A. Benavides, 1,945 ft. from N line, 150 ft. from E line of Sur. 660.....T. D. 2,335 ft.; complete 35 bbls.
O. W. Killam's No. 21 Bruni, 1,020 ft. to SW line, 170 ft. to NW line of Sur. 3 .....T. D. 1,754 ft.; drlg.

ESCOBAS POOL—ZAPATA COUNTY

Pray & Chamberlain's No. 4 Garza, Block 1, Comitas grant .....Making location.
E. K. Bateman's No. 1 M. Garza, in Comitas grant, 200 ft. to NW line, 660 ft. to NE line of Blk. 29.....Derrick.
Trevino Oil Corp.'s No. 12-A Trevino 665 ft. to S line 550 ft. to W line of Block 15, Survey 412 .....Rigging up.

KILLAM-CUELLAR POOL—ZAPATA COUNTY

O. W. Killam's No. 28-A Cuellar, in Cerrito Blanco grant.T. D. 1,558 ft.; abnd.
O. W. Killam's No. 29-A Cuellar, in Sur. 277.....T. D. 1,551 ft.; abnd.
O. W. Killam's No. 30-A Cuellar 570 ft. to NE line 1,720 ft. to NW line of Cerrito Blanco grant .....T. D. 1,365 ft.; drlg.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

Southern Coastal Oil Co.'s No. 3 Perkins, John Jones Sur., 150 ft. N of No. 2 .....Derrick.
The Texas Company's No. 37 Koehler, J. B. Stevenson Sur., 717 ft. E and 603 ft. S of NW cor. of SW Fee tract .....Rig.
The Texas Company's No. 46 Stevenson fee, 1,630 ft. N and 1,690 ft. W of SE cor. of J. B. Stevenson Sur... Derrick.

PORT NECHES—ORANGE COUNTY

The Texas Company's No. 1 Polk-Kuhn-Glass, 260 ft. E and 1,545 ft. S of SW cor. Marshall Beaucham Sur., in the T. J. Notgrass Sur. .....Drlg. gumbo and boulders 1,566 ft.
The Texas Company's No. 3 Kuhn, 587 ft. S and 150 ft. W of NE cor. of the Mary E. Hall Sur. No. 3 ... Location.

HULL—LIBERTY COUNTY

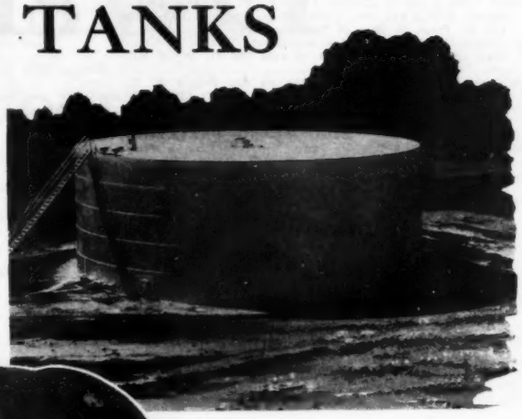
Republic Prod. Co.'s No. 144 Dolbear, Jesse Devore Sur., 250 ft. W of No. 97 and 200 ft. SW of No. 99.....Drlg. sand, shale and boulders 1,298 ft.
Wenoedan Oil Co.'s No. 2 Palmer, Chas. Underton Sur... Bailed salt water 2,050 ft.; drlg. deeper 2,120 ft.
Sun Oil Co.'s No. 10 Carr .....Sand and shale 850 ft.; cem. 10-in. casing 697 ft.

FOR REFINERY PLATE WORK AND FIELD ERECTED TANKS

Any Type or Any Size

REFINERS, marketers and pipe line companies everywhere prefer Horton tanks and plate work because their design and construction are the result of long experience in oil field problems . . . they are backed by a consistent record of satisfied users . . . four modern fabricating plants assure time and money saving delivery . . . our own experienced erection crews are available anywhere.

We appreciate the opportunity of submitting prices on all kinds of refinery platework, field erected and cylindrical tanks, Wiggins Roofs and Horton products. Please address our nearest office.



Above: Wiggins Breather Roof on a 25,000 barrel Horton Tank. Left: 10x24 ft. pressure drum, ready for shipment to a refinery.

CHICAGO BRIDGE & IRON WORKS

Dallas ..... 1241 Burt Bldg.
Houston ..... 1119 Electric Bldg.
Tulsa ..... 2406 Exchange Bank Bldg.
Birmingham ..... 1536 Fiftieth St., N.
Chicago ..... 2128 Old Colony Bldg.
Detroit ..... 1514 Lafayette Bldg.
Cleveland ..... 2204 Midland Bank Bldg.
New York 3147 Hudson Terminal Bldg.
Philadelphia .....
..... 2615 "1616" Walnut St. Bldg.
Boston ..... 1517 Consolidated Gas Bldg.
San Francisco ..... 1054 Rialto Bldg.
Seattle ..... 4323 Smith Tower
Los Angeles ..... 1323 Pacific Mutual Bldg.
Havana, Cuba ..... Apartado 2507

Cash in on this investment!

PIPES, valves, fittings, and drilling equipment represent a substantial investment. Reclamation methods must therefore be economical, simple, thorough and quick.

Give discarded fittings a short soak in an Oakite solution. Every trace of muck and grease is quickly and easily removed. Scraping and scrubbing are practically eliminated. Many parts are ready for immediate re-use; simple, inexpensive repairs restore others to longer useful life.

Let our Service Man in your vicinity show you how much money Oakite cleaning can save for you. Write us and he will call.

Manufactured only by

OAKITE PRODUCTS, INC., 44C Thames Street, NEW YORK, N. Y.

OAKITE

Industrial Cleaning Materials and Methods

PROCESS PIPING

Put It Up To Power Piping

There is more to a job of process piping than mere material or correct design or fabrication! A knowledge of the requirements to be met and the most economical method of serving the particular needs is the first essential . . . Power Piping Company engineers can provide the plan and this company's entire facilities are back of its execution!

POWER PIPING CO. * PITTSBURGH

O-3

PIERCE JUNCTION—HARRIS COUNTY

Gulf Production Co.'s No. 33 Taylor, James Hamilton Sur. No. 53, 300 ft. E of No. 32 and 50 ft. from S line ..... Total depth 1,407 ft.; plugged to 866 ft.; drlg. gumbo 1,000 ft.

Moody Corp.'s No. 2 Boyles (W.O.), W. E. Armstrong Subd., B.B.B.&C. No. 1,028, 50 ft. from E line and 101 ft. from N line of tract ..... Pulling liner to deepen 3,872 ft.

Rio Bravo Oil Co.'s No. 19-A Settegast (W.O.), J. Kopman Sur. No. 44, 2,585 ft. S and 285 ft. W of NE cor. "A" lease ..... Killing well to deepen 4,226 ft.

Southern Petroleum Co.'s (Tilton et al) No. 1 N. C. Barnes, B.B.B.&C. Sur. No. 1,028, 15 ft. from N line and 25 ft. from W line of Blk. 49, Jones Subd... Sand showing oil 3,463-99 ft.; test'ng.

HIGH ISLAND—GALVESTON COUNTY

Yount Lee Oil Co.'s No. 20 Cade, N. Fitzsimmons Sur., 161 ft. W of No. 15 and 146 ft. SW of No. 17 ..... Shut down 60 ft.

Yount Lee Oil Co.'s No. 22 Cade, N. Fitzsimmons Sur., 125 ft. S of No. 21 ..... Drlg. hard sand and lime 5,024 ft.

Yount Lee Oil Co.'s No. 23 Cade, N. Fitzsimmons Sur., 300 ft. S of No. 22..... Drlg. sandy lime 3,362 ft.

DAMON MOUND—BRAZORIA COUNTY

Layne et al's No. 8 Wisdom, 155 ft. from NW line and 150 ft. from NE line, Lot 52, Blk. D, Wisdom Subd., A. Darst Sur. ..... Drlg. shale and shell 3,263 ft.

ORCHARD—FORT BEND COUNTY

Gulf Production Co.'s No. 30 Moore, Mark Smith Sur., 400 ft. N and 600 ft. W of No. 29 ..... Drlg. sandy shale 2,412 ft.

ORANGE—ORANGE COUNTY

Jefferson Prod. Co.'s No. 1 Bland ..... Sandy shale 2,980 ft.; drill stem stuck.

LOCKWOOD—FORT BEND COUNTY

Cullen & West and Gulf Prod. Co.'s No. 2-A Lockwood & Sharp (D.D.)..... Set 90 ft. 4½-in. screen 5,101 ft.; flowing 8 bbls. hourly, 20 to 70 lbs. pressure, ⅝-in. choke, 25.7 gravity (corrected).

Cullen & West and Gulf Prod. Co.'s No. 3-A Lockwood & Sharp, J. Rabb Sur., 600 ft. E of No. 2-A.. Killed gas well 3,107-39 ft.; drlg. deeper in sandy shale 3,189 ft.

Cullen & West and Gulf Prod. Co.'s No. 4-A Lockwood & Sharp, J. Rabb Sur., 550 ft. W of No. 3-A ..... Derrick.

Cullen & West and Gulf Prod. Co.'s No. 3 H. P. Lockwood, J. Rabb Sur., 300 ft. N and 900 ft. W out of SW cor. 333-acre tract ..... Location.

Cullen & West and Gulf Prod. Co.'s No. 2 A. P. George, J. Rabb Sur., 300 ft. S and 905 ft. E out of NW cor. 200-acre tract ..... Hard sand showing oil 5,123-74 ft.; cem. 6⅝-in. casing 5,115 ft.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 6 Lost Lake, 2,361 ft. W and 289 ft. S of No. 5 in Lost Lake ..... Drlg. lime 3,333 ft.

NASH—FORT BEND COUNTY

Harrison & Abercrombie's No. 15 Nash, Thomas Alsbury S League, 450 ft. E and 75 ft. S of Rycade Oil Corp.'s No. 13 Nash ..... Total depth 4,814 ft.; sidetracking stuck drill stem 4,200 ft.

MOSS BLUFF—LIBERTY AND CHAMBERS COUNTIES

Gulf Production Co.'s No. 4 McFaddin, J. McFaddin Sur.. Drlg. gumbo 4,583 ft.

Humble Oil & Ref. Co.'s No. 3 Sterling, James McFaddin Sur., 150 ft. from N line and 1,650 ft. from E line of 513-acre tract ..... Total depth 5,624 ft.; reaming.

RACCOON BEND—AUSTIN COUNTY

Humble Oil & Refining Co.'s No. 1 Martha Remmert, 221 ft. NW along property line from E cor. Fritz Dieutrich 50-acre tract and 225 ft. NE at right angles, Thos. Bell Sur. ..... Rigging up.

REFUGIO—REFUGIO COUNTY

Larco Gas Petroleum Co.'s No. 4 Strauch heirs, 150 ft. from N line and 150 ft. from W line, Lot 6, Blk. 2.. Rig.

United Prod. Corp.'s No. 6 O'Brien, 150 ft. from S line of tract, 350 ft. W of No. 3 ..... Oil sand 6,438-51 ft.; twisted off joint drill stem; S.D.; waiting orders.

Moody-Seagraves Prod. Co.'s No. 2-A St. John, Refugio town tract, 600 ft. E of No. 1-A and 300 ft. from N line of lease ..... Rig.

United Prod. Corp.'s No. 2-A W. J. Fox, Wm. Hews and L. Brown Sur., 2,099 ft. NE along SE line from SE cor. of lease, thence 1,690 ft. NW at right angles ..... Cored S.W. sand 4,725 ft.

SOUTH LOUISIANA FIELDS

LOCKPORT—CALCASIEU PARISH

Vacuum Oil Co.'s No. 32 Miller, 925 ft. E and 480 ft. S of NW cor. S half of NW of Sec. 9-10s-9w ..... Location.

Vacuum Oil Co.'s No. 5-A Farquahar, 105 ft. S and 110 ft. E of NW cor. SW NE, Sec. 8-10s-9w ..... Set 1 joint screen 6,482 ft.; comp. flowing 1,000 bbls. P.L.O., ¾-in. choke, 1,800 lbs. pressure on casing and 900 lbs. on tubing.

JENNINGS—ACADIA PARISH

Jennings Pet. Co.'s No. 2 Eunice Crowley (W.O.), 325 ft. S and 50 ft. W out of the NE cor. of Sec. 42-9s-2w. Sand showing oil 4,234 ft.; cem. casing.

Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, 5,435 ft. E and 1,070 ft. N of SW cor., Sec. 47-9s-2w ..... Wash sand 7,794 ft.; reaming.

SORRENTO—ASCENSION PARISH

Gulf Ref. Co.'s No. 20 United Land Co., 4,040 ft. N and 760 ft. W. SE cor., Sec. 15-10s-4e ..... Location.

HACKBERRY—CAMERON PARISH

Calcasieu Oil Co.'s No. 27 Watkins, 1,150 ft. N and 1,590 ft. W of SE cor. Sec. 13-12s-10w ..... Rigging up.

Calcasieu Oil Co.'s No. 3 Landry, Sec. 13-12s-10w, 150 ft. from N line of 11-acre tract and 300 ft. E of No. 1.. Cap rock 2,905-70 ft; plugged to 2,658 ft.; cem. 6⅝-in. casing 2,641 ft.

R. E. Seiss' No. 3 Vincent, 2,195 ft. S and 1,220 ft. W of NE cor. Sec. 30-12s-10w ..... Location.

R. E. Seiss' No. 2 J. M. Vincent ..... Shut down 2,163 ft.

J. G. Sutton's No. 2 Irwin, 1,600 ft. W and 200 ft. N of SE cor. NE SE of Sec. 13-12s-10w..... Drlg. 2,605 ft.

Yount Lee Oil Co.'s No. 43 State, 1,690 ft. W and 1,320 ft. N of SE cor. of Sec. 13-12s-10w ..... Drlg. rock 2,630 ft.

Yount Lee Oil Co.'s No. 44 State, 1,110 ft. N and 1,915 ft. W of SE cor., Sec. 13-12s-10w ..... Location.

Yount Lee Oil Co.'s No. 45 State, 1,320 ft. N and 310 ft. W of SE cor., Sec. 13-12s-10w ..... Location.

Yount Lee Oil Co.'s No. 46 State, 1,320 ft. N and 1,555 ft. W of SE cor., Sec. 13-12s-10w ..... Location.

Yount Lee Oil Co.'s No. 47 State, 1,420 ft. N and 1,408 ft. W of SE cor., Sec. 13-12s-10w ..... Location.

STARK—CALCASIEU PARISH

Gulf Refining Co.'s No. 28 Lutcher-Moore, Sec. 19-9s-12w.. Comp. pumping 25 bbls. oil 1,204 ft.

SWEET LAKE—CAMERON PARISH

Pure Oil Co.'s No. 5 Sweet Lake (D.D.), Sec. 12-13s-8w.. Rigging up to deepen 5,658 ft.

MISCELLANEOUS WILDCATS

TEXAS

AUSTIN COUNTY

O'Hara Oil & Gas Co.'s No. 1 Neilous, J. C. Cummings-Hacienda Sur., 650 ft. N of No. 1 Schroeder in 18-acre tract, north edge Mill Creek ..... Derrick.

Pomacal & Boletka's No. 1 Schebajsa, 329 ft. N, 78 degrees E of N cor. B. Dottery Sur., near center of SW line of S. F. Austin 4 League on west fork of Mill Creek ..... Rig.

BRAZORIA COUNTY

The Texas Co.'s No. 2 Belcher, Harvey N. Little Sur., 1,728 ft. southeasterly from N cor. of S half of Sur., along NE line and thence 123 ft. at right angles ... Derrick.

United Oil Syndicate's No. 1 Levitt, 900 ft. from W line and 400 ft. from S line of John Peske Sur. ..... T.D. 1,594 ft. in gumbo; drill stem stuck.

BURLESON COUNTY

Marek & Son's No. 3 A. Marek, N. McFaddin Sur., 1,068 ft. N and 225 ft. W of SE cor. of tract ..... Drlg. shale 1,630 ft.

Marts et al's No. 1 W. H. Boyett, W. McWilliams Sur., 3,168 ft. N of N cor. of City National Bank 208-acre tract and 300 ft. SE of NW line of Boyett tract.. Drlg. hard sand 2,941 ft.

Mid-South Oil Co.'s No. 1 Duckworth (W.O.), E of Clay Station ..... Shut down 3,070 ft.

FORT BEND COUNTY

Stone & Wyman's No. 1 Beard, E.&T.C. Sur. No. 118, 1,150 ft. from NW line and 1,892 ft. from NE line.... Drlg. gumbo and lime 1,250 ft.

GRIMES COUNTY

Rianjo Oil Co.'s No. 2 Cuthrell, Pat B. O'Connor Sur., C of 110-acre tract ..... Shut down for fuel 2,932 ft.

HARRIS COUNTY

Givens & Daybault's No. 1 Lobit, David Middleton Sur., Blk. 19, Lobit Subd. ..... Drlg. sand 2,237 ft.

Humble Oil & Ref. Co.'s No. 2 Irwin (D.D.), Mykawa, Wm. Lovett Sur. ..... Drlg. shale 5,795 ft.

Humble Oil & Ref. Co.'s No. 5 Minnetex, Mykawa, 150 ft. from S line and 200 ft. from W line, Lot 261, Wm. Lovett Sur. ..... Location.

J. P. Hunnicutt's No. 1 Haney, T. Pitching Sur,. 150 ft. out of NE cor. of Geo. E. Haney 730-acre tract ..... Drlg. shale 4,945 ft.

Louisiana Oil & Dev. Co.'s No. 1 J. W. Wilson, W. Ritchie Sur. ..... Location.

Shubert & Alexander's No. 1 Herman Hale, 1,058 varas E of NW cor. R. A. Hanks Sur., thence 790 varas S and thence 70 varas W 74° ..... Shut down in gumbo 2,206 ft.

JACKSON COUNTY

Chicago-Gulf Oil Co.'s No. 9 Drushell, Edna F. Rodriguez Sur., 1,080 ft. N, 58° E No. 8 ..... Drlg. shale and lime 2,592 ft.

JEFFERSON COUNTY

Humble Oil & Ref. Co.'s No. 1 Nelson, Wm. Rice Sur., 550 ft. from N line and 50 ft. from E line of W½ of 1,071-ac. tract ..... Drlg. shale 1,626 ft.

John I. Pipkin and Elam's No. 1 Broussard, McGaffey Sur., 800 ft. from S line in center E and W of 206-ac. tract ..... Rig.

Texas Gulf Sulphur Co.'s No. 1 Thompson, Fannett, Wm. Smith Sur., 1,950 ft. W and 1,600 ft. S of NE cor. of Thomas 446-acre tract ..... Sulphur test.

Texas Gulf Sulphur Co.'s No. 5 Thomas, Fannett, Wm. Smith Sur., 300 ft. W and 1,200 ft. N of SE cor. of E 446-ac. tr. ..... Sulphur test.

Westbury Oil Co.'s No. 4 West, 450 ft. W and 4,210 ft. S of NE cor. of T. D. Yoakum Sur. ..... Drlg. gumbo 553 ft.

L. B. House's (I. R. Ingram) No. 1 C. T. Palmer, James Fenner Sur., 1,000 ft. from W line and 850 ft. from S line of tract ..... Drlg. water sand 2,921 ft.

Hamm et al's No. 1 Harvard, Davis Hill ..... Gumbo 1,015 ft.; S.D.

MATAGORDA COUNTY

United North & South Oil Co.'s No. 1 Stoddard, J. C. Keller Sur., 150 ft. W and 545 ft. N of SE cor. Blk. 53 Buckeye townsite ..... Cem. 10-in. casing 1,149 ft.

Harvey Smith's No. 1 Boker (Citrus Grove), J. V. Criswell Sur., Robbins Subd., 2,000 ft. S and 2,000 ft. E of NW cor. of Lot 14 and Lot 15 ..... Rig.

MONTGOMERY COUNTY

Hogg Bros.' No. 1 Sealey, Jas. Pevehouse Sur., 1,575 ft. N of N line of Horton & Woodson's 1,563-ac. tr., and 3,226 ft. E of W line of H. & W. 1,870-ac. tr. .. Rig.

Humble Oil & Ref. Co.'s No. 1 W. A. Penn, 750 ft. from N line and 900 ft. from E line of S. J. McFarland Sur. ..... Drlg. shale 3,187 ft.

Stanolind Oil & Gas Co.'s No. 1 R. M. Gary, Jacob Shannon Sur., 150 ft. SW of SW cor. D. Pitts 91-acre tract in R. M. Gary 633-acre tract ..... Rigging up.

Strake et al's No. 1 South Texas Dev. Co., 468 ft. in westerly direction along N line of Theo. Slade Sur. from SW cor. of A. McGowan Sur., and thence 750 ft. in southerly direction at right angles from said line in Slade Sur. ..... Drlg. gumbo 4,106 ft.

ORANGE COUNTY

Altex Oil Co.'s (Veteran Oil Co.) No. 1 Reed, A. Nelson Sur. No. 1, 500 ft. from N line and 250 ft. from E line of tract ..... T.D. 4,603 ft.; sidetracked 1,300-2,200 ft.; S.D.

Crew Oil Co.'s No. 1-A Mansfield, 50 ft. E of No. 1 ..... S.D. 1,710 ft.

POLK COUNTY

Freeman et al's No. 2 Freeman ..... S.D. 3,162 ft.

T. B. Hoffer's No. 1 Saner-Ragly Lbr. Co., 200 ft. out of most northerly cor. of most easterly County School Land Abst. 271 ..... Drlg. shale 1,173 ft.

Trans-Coastal Oil Co.'s No. 1 M. E. Roberts, J. F. Rumayor Sur., 250 ft. from W line and 150 ft. from N line of tract ..... S.D. 734 ft.

REFUGIO COUNTY

Blanco Creek Oil Co.'s No. 1 Damaan, 150 ft. from N line and 150 ft. from W line of Blk. 14, Bonnie View Ranch Subd. ..... Shut down 4,627 ft.

Humble Oil & Ref. Co.'s No. 1 O'Connor, John Keating Sur., 6,012 ft. S from NE cor. along SE line of Lon T. Ross Sur., thence 7,375 ft. W at right angles in John Keating Sur. ..... Trying to pull stuck drill stem 3,814 ft.

SAN JACINTO COUNTY

E. P. Edwards' No. 1 J. R. Bennett, Cold Springs ..... S.D. 750 ft.

TRINITY COUNTY

Scientific Prodcers Co.'s No. 1 Thompson, I.&G.N. Sur. No. 47, 50 ft. out of NE cor. of H. K. Thompson 199-ac. tr. ..... Rig.

TYLER COUNTY

King Oil Co.'s No. 1 Caswell ..... Sand and shale showing oil 1,250 ft.; cmtd. 6-in. csg. 1,218 ft.

Allied Pet. Co.'s (Texas Southern Pet. Co.) No. 2 Wilson, Mrs. E. Cherry Sur. No. 798, 1,500 varas from W line and 600 varas from N line ..... Fishing 5,025 ft.

VICTORIA COUNTY

Bunte et al's No. 1 Keeran, 3,714 ft. NE along railroad from SW line of Martin DeLeon Sur., and thence 1,600 ft. NW at right angles ..... Spudded.

Houston Oil Co.'s No. 1 Conrad, T.&N.O. Sur. No. 1, 1,100 ft. from SW line and 100 ft. from NW line ... Preparing to resume drilling 5,170 ft.

The Texas Company's No. 3 McFaddin, S 15° W., 6,200 ft. and N 75° W 1,850 ft. out of NE cor. John M. Rine Sur. ..... Fishing core barrel 4,424 ft.

United Prod. Corp.'s No. 5-A McFaddin, 4,250 ft. N along extended E line of C. L. Mann Sur., in Maria Traviesa Sur. ..... Plugged from 3,828 to 3,760 ft., set 20 ft. 4½-in. screen 3,740-3,760 ft.; comp. 30,000,000 ft. dry gas, 1,150 lbs. W.P., 1¼-in. choke.

WALLER COUNTY

McDaniel and associates' No. 1 Citizens State Bank, B.B.B.&C. Sur., C of 150-ac. tract ..... Rig standing.

WASHINGTON COUNTY

Moon & Yeager's No. 1 Hahn, 500 ft. from N line and 1,852 ft. from W line of J. H. Alcorn Sur., Abst. 3.. Drlg. 3,549 ft.

Here's the answer

to *"hot spots"* on your pipe line map!

Use "soil-tested" Sherwin-Williams

LYNE-KOTE

The rapid development of underground transportation calls for special attention to adequate and lasting pipe protection. Lines in sections of the country where corrosive action is particularly severe have to be replaced in as short a time as two years. Such excessive expense can be materially reduced through the use of Lyne-Kote, an exceptionally tough and non-porous coating that is meeting the approval of pipe line superintendents throughout the industry.

Lyne-Kote is not a "made over" pitch but a special formula perfected in our laboratories and tested in actual service. It is a heavy, non-cracking, non-peeling coat that is oil and waterproof. It resists acids and alkalies and insulates against electrolysis. Its elasticity enables it to cope with soil stresses and to expand and contract with the pipe.

A hot application of Lyne-Kote on iron pipe immersed in a 5% salt solution for one year showed no signs of deterioration whatever. Tests in the field have further proved that Lyne-Kote gives longer service. One oil company engineer wrote:

These features mean better pipe protection

1. Impervious to air, moisture, acids, alkalies and petroleum products.
2. Insulating properties prevent electrolysis.
3. Grips surface of pipe—expands and contracts with it. Resists soil pressure.
4. Does not become brittle or run off pipe at normal temperatures.
5. Withstands shocks and abrasion.
6. Applied hot, hardens in a few minutes—applied cold, in 8 to 10 hours.
7. No bubbles or pin holes.

"It is standing up exceptionally well and I am prepared to say that it is by far superior to all other materials tested to date."

80,000 gallons have been used in 7 months by a large manufacturer of pipe lines. Meeting mill production schedules has been facilitated by the development of a quicker-drying Lyne-Kote Primer for mill use. Regular Lyne-Kote Primer and Enamel recommended for field use—hot or cold.

It will pay you to get all the facts about Lyne-Kote. Our Technical Staff will work with you on any coating problem. THE SHERWIN-WILLIAMS CO., Cleveland, Ohio. World's Largest Manufacturers of Protective Coatings.

SHERWIN-WILLIAMS

LYNE-KOTE

MAIL COUPON FOR INFORMATION

THE SHERWIN-WILLIAMS CO.,
Cleveland, Ohio.

Gentlemen: Please send me complete information on LYNE-KOTE.

Name _____

Company _____

Address _____

Penn-Tex Oil Co.'s No. 2 Kamas Brenham, S. M. Williams Sur. ..... Drlg. anhydrite 3,490 ft.

WHARTON COUNTY

Beard & Brumblow's (Shibe & Gray) No. 1 Brown (W.O.), S of El Campo ..... Shut down 3,041 ft.
W. H. Wallace et al's No. 1 Lee, 600 ft. S and 800 ft. W from NE cor., Sec. 18, G.H.&H. Sur. ..... Drlg. gumbo 2,193 ft.

SOUTH LOUISIANA

ASCENSION PARISH

McElroy Petroleum Co., 150 ft. S and 150 ft. W of NE cor., Sec. 29-10s-4e ..... Shut down 4,070 ft.
Crawford Doyle's No. 1 Johnson, Sec. 23-9s-15w ..... S.D. 875 ft.
I. O. Davis' No. 1 Industrial, Sec. 29-9s-10w ..... Standing 6,568 ft.
Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w ..... S.D. 3,650 ft.
Success Oil Co.'s No. 1 Hewitt, 90 ft. out of SW cor., Sec. 11-9s-11w ..... Rig.
Vacuum Oil Co.'s No. 1 Walt (D.D.), 225 ft. out of SE cor., Sec. 12-9s-7w ..... Sand showing oil 6,965 ft.; cem. 7-in. casing 6,932 ft.

CAMERON PARISH

Vacuum Oil Co.'s No. 2 Cameron Meadows, 3,120 ft. S and 1,900 ft. W from NE cor., Sec. 31-14s-9w (500-ft. S No. 1) ..... Set 1 joint screen 5,273 ft.; comp. flowing 1,000 bbls. P.L.O., 800 lbs. pressure, ¾-in. choke; shut in.

IBERIA PARISH

Jefferson Lake Oil Co.'s No. 21 Lake Peigneur, Sec. 58-12s-5e, 300 ft. NW of No. 20 ..... Sulphur test.
Standard Oil Co.'s No. 2 Myrtle Grove-Wilbert, Bayou Choctaw, 2,040 ft. N and 600 ft. W of center of Sec. 52-9s-11e ..... Derrick.
Standard Oil Co.'s No. 2 Gay, Bayou Choctaw, 4,500 ft. N and 600 ft. E of SW cor. SE of Sec. 52-9s-11e .... Location.
Jefferson Lake Oil Co.'s No. 22 Lake Peigneur, Sec. 58-12s-5e, 600 ft. NW of No. 21 ..... Sulphur test.
Jefferson Lake Oil Co.'s No. 23 Lake Peigneur, Sec. 58-12s-5e, 600 ft. NW of No. 22 in line with No. 21.. Sulphur test.
Jefferson Lake Oil Co.'s No. 24 Lake Peigneur, Sec. 58-12s-5e, S 600 ft. 79 deg. 30 min. W of No. 23 ..... Sulphur test.

IBERVILLE PARISH

Standard Oil Co.'s No. 1 Myrtle Grove-Wilbert, Bayou Choctaw, Sec. 52-9s-11e, 250 ft. W No. 1 Gray ..... Salt 2,566-2,712 ft.; plugged to sand 2,410-73 ft.; cem. casing 2,405 ft.
Standard Oil Co.'s No. 6 Schwing, Bayou Blue, Sec. 73-9s-11e, 317 ft. S of No. 2 ..... Drlg. sandy shale 5,320 ft.

LA FOURCHE PARISH

State Production Co.'s No. 1 Mrs. W. H. Stark, Chacahoula Dome, 1,921 ft. E and 1,340 ft. S of NW cor., Sec. 71-15s-15e ..... Abd. sulphur test.
State Production Co.'s No. 1-B Mrs. W. H. Stark, Chacahoula Dome, 1,921 ft. E and 1,540 ft. S of NW cor., Sec. 71-15s-15e ..... Abd. sulphur test.
State Production Co.'s No. 1-C Mrs. W. H. Stark, Sec. 71-15s-15e ..... Sulphur test.
The Texas Co.'s No. 3 L. L. and E. Leesville, 4,439 ft. S and 468 ft. E of NW cor., Sec. 26-21s-22e..... Derrick.

PLAQUEMINES PARISH

Humble O. & R. Co.'s No. 5 Cockrell-Moran, Lake Grand Ecaille, 10,377 ft. N and 2,614 ft. W of NE cor. of Twp. 21s-26e ..... Location.
Humble O. & R. Co.'s No. 6 Cockrell-Moran, Lake Grand Ecaille, Twp. 21s-26e, 5,000 ft. E of Washington Sta. ..... Coring sand 977 ft.

TERREBONNE PARISH

La. Gas & Fuel Co.'s No. 2 Minor, 3,480 ft. S and 1,980 ft. E of NW cor., Sec. 3-18s-16e ..... Drlg. gumbo 2,351 ft.
The Texas Company's No. 2 La.L.&E., Bay Junop ..... Drlg. sticky shale 2,227 ft.
The Texas Company's No. 4 La.L.&E., Bay Junop ..... Location.
The Texas Company's No. 10 State, Lake Barre ..... Location.
The Texas Company's No. 11 State, Lake Barre ..... Drlg. hard sand 519 ft.
The Texas Company's No. 12 State, Lake Barre ..... Location.
The Texas Company's No. 14 State, Lake Barre ..... Location.
The Texas Company's No. 1 L.L.&E., Lake Barre, 2,645 ft. S and 595 ft. E of NW cor., Sec. 30-21s-20e... Location.

VERMILLION PARISH

Pure Oil Co.'s No. 2 Southwest Louisiana Land Co., 1,300 ft. E and 300 ft. S of NW cor. Sec. 4-12s-1W Drlg. sand 5,270 ft.

WEST FELICIANA PARISH

Putnam Syndicate's No. 2 Como Plantation, Sec. 51-1s-4w. Shale and lime 2,950 ft.; waiting on 8¼-in. csg.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 37)

FORD COUNTY

Carter Oil Co.'s No. 1 Everett, C NE, Sec. 22-29-21w....Fishing 6,088 ft.

GRAHAM COUNTY

Schleimeyer et al's No. 1 Clark, SW NE NE, Sec. 11-9-25w ..... Shut down 4,648 ft.

HARVEY COUNTY

Liggett et al's No. 1 Davis, SW SE NE, Sec. 7-24-1.....Shut down 1,505 ft.
J. P. Flannigan's No. 1 Sheridan, C SW, Sec. 32-22-1....Drlg. 3,522 ft.

KINGMAN COUNTY

Skelly Oil Co.'s No. 1 Miles, NE cor., Sec. 30-27-10w.....1,635-40 ft. 2,000,000 ft. gas; at 2,005-20 ft. 6,000,000 ft. gas; at 2,122-42 ft. 3,000,000 ft. gas; showing oil 2,385 ft.; T. D. 2,441 ft.; shut down; estimated at 600 bbls. a day.
Panhandle Drilling Co.'s No. 1 Wetherall, C SE NW SW Sec. 20-28-10w ..... Rig.

MORTON COUNTY

Hydraulic Oil Co.'s No. 1 State Land, NW SE, Sec. 22-34-43w ..... T. D. 3,640 ft.; temp. abnd.

MORRIS COUNTY

Allender et al's No. 1 Wycoff, C SW SE, Sec. 5-17-7.....Shut down 195 ft.
Urschel et al's No. 1 Bersuch, NW SE NW, Sec. 10-17-7..Drlg. 700 ft.
Hankerson et al's No. 1 Cessman, SW SE, Sec. 24-16-9...Shut down 2,625 ft.

NORTON COUNTY

Richards et al's No. 1 Colby, Sec. 17-4-21w.....Rig.

OSAGE COUNTY

Briggs & Smith's No. 1 Wood, SE NW, Sec. 21-14-15.....Shut down 2,058 ft.

RAWLINS COUNTY

J. G. Durham et al's No. 1 Weaver, SE cor., Sec. 1-2-35w..Drlg. 3,925 ft.

RICE COUNTY

Detrick & Langston's No. 1 Purcell, NW cor., Sec. 33-
Cress et al's No. 1 Sharp, SE NE, Sec. 13-20-10w.....Show oil 3,107-15 ft.; Siliceous 3,330-36 ft.; estimated 1,500 bbls.; shut in.

RUSH COUNTY

Dewey & Mitchell's No. 1 Greenawalt, C SW, Sec. 17-19-16w ..... Show of oil in Conglomerate 3,825-80 ft.; plugged back to 3,825-40 ft.; estimated 150 bbls.; shut down.

RUSSELL COUNTY

Agate Oil & Gas Co.'s No. 1 Rochfellow, SE cor., Sec. 6-13-12w ..... Shut down 3,374 ft.
Twin Mounds Oil Co.'s No. 1 Weis, C W half NE NW, Sec. 20-13-4w ..... Fishing 2,710 ft.

SHERIDAN COUNTY

Flo et al's No. 1 Shoemaker, NE SW, Sec. 27-7-26w.....Drlg. 3,470 ft.

STAFFORD COUNTY

Rosenthal, Stanolind and Amerada's No. 1 Gray, C NE, Sec. 11-24-13w ..... S.D. 3,495 ft.

STEVENS COUNTY

Argus Prod.'s No. 2 Christopher, C NE, Sec. 10-33-39w..Shut down 5,521 ft.

SUMNER COUNTY

Tighe et al's No. 1 Thieson, C NW SE SE, Sec. 22-34-2...Shut down 2,295 ft.
Trees Oil Co. and Shell's No. 1 Springate, NE SE SW, Sec. 6-34-2 ..... Drlg. 2,280 ft.
Spencer et al's No. 1 Porter, NE SW, Sec. 12-35-3w.....Drlg. 3,760 ft.
Otstot et al's No. 2 Marlow, C SE NW SE, Sec. 32-33-3w..Simpson sand 4,535-48 ft; wtr; abd.

WASHINGTON COUNTY

Sincox et al's No. 1 Penwell, NW SE NE, Sec. 16-3-3....Shut down 1,720 ft.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 34)

KIOWA COUNTY

Christian's No. 1 Jones, NE SE, Sec. 3-7-18w ..... Shut down 820 ft.

LATIMER COUNTY

P. English's No. 1 Unknown, NW SE, Sec. 16-6-19 ..... Shut down 1,542 ft.

LINCOLN COUNTY

Hilton Phillip's No. 1 Phillips, SW NW Sec. 2-14-2.....Drlg. 580 ft.
Mote et al's No. 1 School Land, NW cor., Sec. 36-17-5....S.D. 250 ft.

McINTOSH COUNTY

Patterson et al's No. 1 Smith, SW cor. NW SE, Sec. 32-9-16 ..... Drlg. 5,774 ft.

MURRAY COUNTY

Capitol Prod. Co.'s No. 1 Cutchall, SE NE, Sec. 6-1-2....Drlg. 2,420 ft.

MUSKOGEE COUNTY

Sioux Oil Co.'s No. 1 Unknown, NW SE, Sec. 21-11-19...Shut down 1,011 ft.

OKFUSKEE COUNTY

Shepard et al's No. 1 Neveas, SE NW SW, Sec. 3-12-10...Shut down 3,628-90 ft.; Wilcox sand; hole full water.

OKLAHOMA COUNTY

Citizens Oil Co.'s No. 1 Sage Barber, NE cor., Sec. 21-11-3w ..... Shut down 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW, Sec. 17-11-3w ..... Shut down 5,515 ft.
J. F. Cuniff, trustee's No. 1 Church Land, NE NW SE, Sec. 17-12-4w ..... Shut down 6,700 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW, Sec. 6-20-5.....Shut down 1,950 ft.
Cochran et al's No. 1 Green, NE cor. SW, Sec. 15-23-5....Rig.

PITTSBURG COUNTY

Tape Oil Co.'s No. 1 Fulton, SE, Sec. 34-7-14.....Shut down 1,200 ft.
J. Morrison's No. 1 Fowler, NE SE, Sec. 13-7-17.....Rig.
C. Kennedy's No. 1 Travis, C SW NE, Sec. 15-7-14.....Rig.
C. Canady's No. 1 Jones, NW cor., Sec. 14-8-14.....Rig.

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW, Sec. 23-12-24w.....Shut down 5,150 ft.
L. C. Hivick's No. 1 Davis, C NW NE, Sec. 4-11-26w.....Shut down 3,275 ft.

SEQUOYAH COUNTY

Braman Oil Co.'s No. 1 Unknown, C NW SW Sec. 29-13-22 ..... Drlg. 725 ft.

WASHITA COUNTY

Cooper & Terhune's No. 1 Blocker, NW cor., Sec. 29-8-15w ..... Shut down 2,440 ft.
Burns & Prince's No. 1 Deck, SW cor., Sec. 21-8-18.....Shut down 1,140 ft.

OKLAHOMA PANHANDLE

TEXAS COUNTY

Three Way Oil Co.'s No. 1 Crane, SW NW, Sec. 11-1-1S..Shut down 4,750 ft.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Morris et al's No. 1 Mansell, SW NW NW Sec. 9-2s-12 ...Drlg. 285 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE, Sec. 18-3s-10 ..... Shut down 1,530 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW, Sec. 7-7-10..T. D. 650 ft.
Bush et al's No. 1 Commerce Trust, NE cor., Sec. 35-6s-9 ..... T. D. 740 ft.; plugged back to 450-80 ft.

CHOCTAW COUNTY

Hobson Bros.' No. 1 McChristian, NW NE NE, Sec. 12-68-19 ..... Drlg. 730 ft.

JEFFERSON COUNTY

Smith's No. 1 McCarty, SE NW NE, Sec. 18-4s-3w.....Location.

LOVE COUNTY

Autrey et al's No. 2 Cross, CWL SE NE, Sec. 27-6s-2.....Show oil and gas 970-72 ft. and 1,324-34 ft.; shut down; T. D. 1,634 ft.

MARSHALL COUNTY

Everette et al's No. 1 Agres, SE NE, Sec. 14-7S-6 .....Rig.
Summers-Sellers' No. 1 Beams, NE SW NE SW Sec. 20-7s-5 ..... Rig.
Dixson's No. 1 McDuffel, SW SE, Sec. 3-7s-6.....Drlg. 997 ft.
Taliaferro et al's No. 1 fee, NW SE SE NW, Sec. 34-5s-5 ..... Landing csg.; T.D. 580 ft.

McCURTAIN COUNTY

The Oil Journal's No. 1 Parks, C NE SW, Sec. 17-6s-25..S.D. 1,014 ft.
Stewart's No. 1 Patterson, C SE SE, Sec. 7-6s-24..... Shut down 756 ft.

PUSHMATAHA COUNTY

George's No. 1 Lane, NW SE, Sec. 32-3s-15.....Shut down 840 ft.
Whitehead et al's No. 1 Messer, SE SW SW, Sec. 35-3s-13 ..... Rig.

STEPHENS COUNTY

Brown's No. 1 Hightower, SW SE NE, Sec. 16-3s-5w.....Sand 990-1,004 ft.; show oil.

EASTERN FIELDS

(Continued from Page 50)

Lime formations are the producing sands in this well.

Wetzel County

In Wetzel County, the Pittsburgh and West Virginia Gas Corp.'s No. 5,401, on the Henry Himelrick farm in Church district, came in as a gasser from a depth of 3,316 feet. The fourth well drilled on the G. D. Stump farm in Center district, Gilmer County, by the Chartiers Oil Co. was reported as a gasser from the Injun sand and a depth of 1,478 feet. In the same district, and on the F. H. Stout farm, the McCall Drilling Co.'s No. 3 was a gas well from the Injun sand at 1,823 feet.

M. F. Crawley completed his test on the A. Hardman farm in Lee district, Calhoun County, in the Berea sand after drilling down to 2,600 feet. This well is producing at the rate of 3 bbls. for the initial period of 24 hours after being shot, and from the Injun sand.

The test of the Monickle Gas Co. on the E. S. Jacks farm in Grant district, Cabell County, is in the sand at 3,588 feet and is awaiting a test, as is the test of Wilson and Nowery on the H. M. D. Kyle lease in Barboursville district. This test is in the sand at 3,016 feet. In Jefferson district, Lincoln County, the test on the Alice Brumfield farm belonging to the Turtle Lick Gas Co. is in the same condition at 2,357 feet.

Ed Smith and others found the Injun sand on the L. S. Force farm in Lee district, Calhoun County, dry at 2,307 feet in a test, and are abandoning the well. The test of Jones and Hess on the Susan Hill farm in Washington district, Boone County, was also found dry at a depth of 2,142 feet.

Drilling in West Virginia

In Ritchie County, Godfrey L. Cabot has selected a location for a test on the J. N. Eddy farm in Murphy district. C. B. Lewis and others have constructed a rig on the W. P. Barker farm in the same district. In Grant district, the

Hoover Oil Co. is shut down in its test on the C. G. Bradley farm at a depth of 900 feet. R. C. Jackson is rigging up on the Rutherford heirs farm in the same district. A rig has been constructed by W. H. Bickle on the U. S. Fluharty farm in Murphy district, and in the same district the King Knob Oil Co. has reached 1,300 feet in drilling a second test on the S. Carpenter farm.

The C. M. Strickland farm is the location of a rig belonging to the Myers Oil Co. The Strickland farm is in Sandhill district, Marshall County. In Walker district, Wood County, the Four States Co. is rigged up but shut down on the John Roberts lease, and in Union district, Robert Elder and others have chosen a location on the William Wilson farm. The test of Warren Brothers on the J. W. Reed farm in Williams district has been driven down to 700 feet but is shut down, as is the test of the Plum Run Oil Co. at 910 feet in its test on the Francis Delancey farm in the same district. In Lubeck district W. H. Bickle has his test on the W. H. Bickle property drilling at 1,450 feet.

In Gilmer County, DeKalb district, Frank Golden and others have constructed a rig on the H. E. Engle heirs property, and A. E. Ellis and others have part of the material on the ground for a test on the O. F. Gainer farm. O. E. Garrett and others are drilling in their test on the E. C. Frame farm at 820 feet. The Frame farm is in Center district, as is the Arnett Collins property on which D. W. Law and others have constructed a rig.

The second test of the Delaware Gas Co. on the Reynolds heirs property in Eagle district, Harrison County, is shut down at 2,400 feet. In the process of drilling its test on the E. D. Fittro farm in Coal district, the Washington Gas Co. has reached 2,575 feet.

Putnam County

Wade Kirtley and others are drilling at 130 feet in their test on the T. C. Erskine farm in Scott district, Putnam County. In the same district, H. C. Zogg and the Celia Oil & Gas Co. have each chosen locations for new wells. The Zogg location is for No. 3 on the Maddox heirs farm, and the Celia Oil & Gas Co. location is for No. 5 on the John Tormey property. The Putnam Natural Gas Co. has reached 2,050 feet in deepening its test on the Rachell West lease in Scott district.

In Calhoun County, Thomas Crowley has started drilling in his No. 3 on the Williams Cooper farm in Sheridan district. The E. C. Moffett Drilling Co. is drilling in its second test on the William Newton heirs farm in Graham district, Mason County, and in Cooper district, the Hartford Salt Works has selected a location for a test on the Burt Sayre farm.

The Cannelton Coal Co. has selected locations for wells No. 15, 16 and 17 on its own property in Cabin Creek district, Kanawha County. The Ownes-Illinois Glass Co. has constructed a rig and has part of the materials on the ground for No. 10 on the C. Q. Crockett farm in Malden district. The Pure Oil Co. has a rig constructed and the tools ready for work on well No. 254 on the Williams Coal Co. tract in Cabin Creek district, and the same operator has the material on the ground for No. 255 located on the same tract. Godfrey L. Cabot is drilling on his No. 23 on the Quincy Coal Co. tract at a depth of 1,140 feet and is constructing a road to the location selected for No. 19 on the same tract. Ellyson and Wilson have driven their drilling tools down to a depth of 540 feet in their test operation on the Virgil C. Tate farm in Union district.

SOUTHWEST PENNSYLVANIA

No wells were reported completed from the Southwest Pennsylvania Field.

In Greene County, D. L. Shafer & Co. are shut down in their test on the William Jones farm in Wayne Township, after sinking the drilling tools to 850 feet. The test of the H. D. Freeland & Co. on the D. T. Freeland farm in Wayne Township is drilling at 2,050 feet.

C. V. Inglefield & Co. have their test on the D. P. Inglefield farm in West Bethlehem Township, Washington County, drilling at 2,200 feet. In Chartiers Township, Potts Brothers have a rig standing on the A. Woodruff farm.

In Pine Township, Allegheny County, and in what is known as the Brush Creek district, the Local Syndicate drilling the test on the R. Kennedy farm now has its drilling tools down 150 feet.

CANADIAN FIELDS

(Continued from Page 45)

In the Lethbridge area, southern Alberta, Texas-Imperial's No. 1, LSD 14, Section 22-8-22w4, is making new hole at 3,798 feet after cementing. Location is west of Lethbridge and east of the Blood Indian Reserve, and the cost of the test is being shared by Imperial Oil, Ltd., and Texas Oil Co. of Canada, the former supervising the drilling. Both companies hold extensive acreage on the Lethbridge structure.

Central Turner Valley

In Central Turner Valley, McLeod Oil Co.'s No. 3, LSD 16, Section 1-20-3w5, is deepening in the lime at 5,240 feet, after getting some increase in wet gas production.

Hudson's Bay Test

In the Keho Lake area, Hudson's Bay Oil & Gas Co.'s Keho No. 1, LSD 2, Section 17-11-22w4, is drilling in the Ellis formation at 4,850 feet, with no further shows since leaving the Benton. The Ellis-Madison contact is regarded as a potential oil horizon. The test encountered a 33 gravity black crude in a sandy zone of the Benton around 3,700 feet, potential production being estimated as high as 60 bbls. a day; but this was temporarily shut off to permit a thorough test of the lower horizons. Location is on one of the domes on the gently folded eastern limb of the Alberta syncline, and the test was spotted only after the dome structure had been defined by extensive shallow drilling. Preliminary estimates indicated that between 4,000 and 6,000 feet of drilling might be necessary to thoroughly test the cretaceous horizons productive in the Montana field; but that the structure was more extensive and more favorably situated than those found productive in the Kevin-Sunburst and Red Coulee areas.

Milk River Oil Show

On the Milk River structure, Commonwealth Petroleums' No. 1, LSD 9, Section 9-3-15w4, is drilling 4½-inch hole in a hard formation near the bottom of the Devonian lime. The test is a little below 5,000 feet and samples show considerable saturation of light green crude. Operators have been looking for a break at the bottom of the Devonian with possibilities of commercial production. The location of the test is on Verdigris Coulee east of Milk River.

Medicine Hat Gasser

In the northeastern extension of the Medicine Hat gas field, No. 3 municipal well, recently completed, is reported good for 4,000,000 feet a day from the Medicine Hat sand. This is stated to be the largest producer yet drilled in the field. A half mile of pipe is being laid to connect the gasser with the city mains.

Red Coulee Test

On the Montana end of the International Red Coulee structure, Askalta Oils' No. 2 Farbo, SW NE Section 2-37-4w, is reported drilling below 1,400 feet and logging somewhat higher than No. 1, which is producing around 200 bbls. a day.

Tests in the Foothills

On the Fisher Creek structure west of Calgary, Cotton Belt Mines' No. 1, LSD 5, Section 21-21-4w5, is drilling below 2,320 feet with a slight increase in the gas flow from the Dalhousie sand. Investigation of the Fisher Creek and Two Pipe areas recently completed by Dr. G. S. Hume of the Geological Survey of Canada indicate a structure favorable to retaining oil production.

British Columbia Drilling

In the Kelowna district, British Columbia, Okanagan Oil & Gas Co.'s No. 1, Section 2-26-Osoyoos, is reported shut down at 1,950 feet for repairs. At this depth the drill is in a gray sandy shale with some shows of oil and gas. Drilling showed a solid bed of lime, chalk and marl from 1,225-1,575 feet, with blue-gray shales and sand rock to 1,700 feet.

On Lulu Island, International Pipe Line Co.'s No. 4 Steveston is reported drilling at 880 feet with gas expected at 920 feet. This test is close to International's No. 3 which was recently completed as a small gasser at approximately 925 feet. If No. 4 proves a fair producer, five or six tests will be started at once in the same area to develop gas in quantities sufficient to justify piping. In the same area, Altamont Oil Co.'s No. 1 is reported working on derrick.

In the Sumas Prairie district, Lancashire Oils' No. 1, Section 22-19-E.C.M., is reported cleaning out at 800 feet preparatory to deepening. This test was taken over from the Sumas Oil & Gas Co. At Abbotsford, about 6 miles west, B. C. Alberta Oils' No. 1, Section 20-16-E.C.M., has drilling equipment on the ground and is planning to spud in within a few weeks. The company is headed by R. H. Wright, who drilled the Empire deep well in the Fraser Valley some years ago. The Empire well held the Canadian deep drilling record for some years. The company holds extensive acreage around Abbotsford, as well as another block close to the Washington boundary; and is reported arranging for further development of its holdings on a royalty basis. In the Abbotsford area, geological investigation indicates potential gas sands between 750 and 1,000 feet and a potential oil horizon between 1,800 and 2,000 feet.

Extensive leasing is being carried on in the Fraser Valley, and hundreds of thousands of acres are reported tied up by companies and syndicates. The area under lease extends from Sumas Lake on the east to Lulu Island and Boundary Bay on the west. Many Calgary operators, following the practical shutdown of the Turner Valley Field, are transferring their activities to British Columbia, while California, Texas, Washington and Montana interests are also active. Several new drilling tests are likely to start this fall.

Ontario Tests

In Ekfrid Township, Middlesex County, Ontario, Union Gas Co.'s No. 1 Ekfrid, Lot 7, Concession 5 south, is reported drilling at 3,115 feet without a show. The test got the top of the Trenton limestone at 2,680 feet.

In Raleigh Township, Kent County, Olga Oil & Gas Co.'s No. 3, Lot 19, Concession 8, is drilling around 900 feet. In the old Tilbury Field, Ralph Dawson is drilling a test for gas on Southern Ontario Gas Co. acreage in the Smart farm, Lot 4, Concession 16, Tilbury East Township.

WOULD PAY FOR OIL LEFT IN THE GROUND

Payment to producers of 40 cents a barrel or more for oil that is not produced is part of a comprehensive plan for world oil stabilization put forward by J. B. Aug. Kessler, joint managing director of the Royal Dutch-Shell group, in World Petroleum. Formation of an international organization composed of representatives of the oil industries in the United States, Rumania and Venezuela, supplied with ample funds to reimburse operators who, by curtailing output, co-operate to keep production within established limits, and a limitation of drilling by state regulation or taxation, to be applied as soon and as long as production exceeds predetermined amounts, are other features of the plan. Each country would, however, be free to decide how much it should produce.

The plan would be continued in effect by quarterly periods until the f.o.b. price for six consecutive months at any market that may be chosen had been at least $1 a barrel, and the price of 64 Baume gasoline had been at least 8 cents a gallon.

The 40-cent payment represents the estimated cost under present conditions of producing that part of total crude output which is in excess of demand, plus the net return from the refined products. Such payments would involve a total of about $22,000,000 a quarter, and it is proposed to raise this fund by requiring producers in the three countries to contribute pro rata per barrel on the total number of barrels which they propose to produce during the quarter.

RUSSIA'S PRODUCTION GAINS 25 PER CENT

Crude oil production in the Soviet Union during the first nine months of this year was 16,474,000 tons (103,610,433 bbls.), exceeding by 3,300,000 tons (20,758,571 bbls.) or about 25 per cent, the production for the same period in 1930.

Crude oil production for all of 1913 was 9,200,000 tons.

Owing to increasing development of the "cracking" system, 252,000 tons of benzine were produced during the nine months this year, as against only 23,000 tons in 1930.

Drilling operations showed virtually the same rate of increase as oil production, 22.6 per cent.

Notwithstanding these increases in both production and drilling, Soviet Russia is 85.6 per cent behind its plan for the period, partly because a shortage of pipe and other materials hindered exploitation of new fields.

Total exports of crude oil during 1929-1930, when 17,405,000 tons were produced, amounted to 4,554,000 tons.

The original five-year plan called for a crude oil production of 21,700,000 tons in 1932-1933, the last year of the plan. This now has been revised upward to 46,000,000 tons.

ORIENT GLAMOR SUGGESTED BY POETS UNDERGOES SOMEWHAT OF A CHANGE

Because of the very many requests received by The Oil and Gas Journal for information regarding work in foreign oil fields, the following poem might interest many readers. It was received from H. G. Montague of Manhattan Beach, Calif.

I Want to Go Home

I'm sick of the Mongol and Tartar;
I'm sick of the Jap and Malay,
And far-away spots on the chart are
No place for yours truly to stay.
I've had enough undersized chicken
And milk that comes out of a can;
The East is no region to stick in
For this one particular man.

I'm weary of curry and rice all
Commingled with highly spiced dope;
I'm weary of bathing with Lysol
And washing with carbolic soap.
I'm tired of itch skin diseases,
Mosquitoes and vermin and flies;
I'm fed up on tropical breezes,
And sunshine that dazzles my eyes.

Oh, Lord, for a wind with a tingle,
An atmosphere zestful and keen,
Oh, Lord, once again just to mingle
With crowds that are white folk—and clean,
To eat without fear of infection,
To sleep without using a net,
And throw away all my collection
Of iodine, quinine, et cet.

To know all the noise and the clamor;
The hurry and fret of the West,
I'd trade all the Orient glamor
That damned lying poets suggest.
They sing of the East as enthralling
(And that's why I started to roam)
But—I hear the Occident calling;
O, Lord, but I want to go home.

Sand Pressure Control in East Texas

Engineer Believes Allowable Should Be Based on This Factor Rather Than Acreage, Potential or So Much Per Well

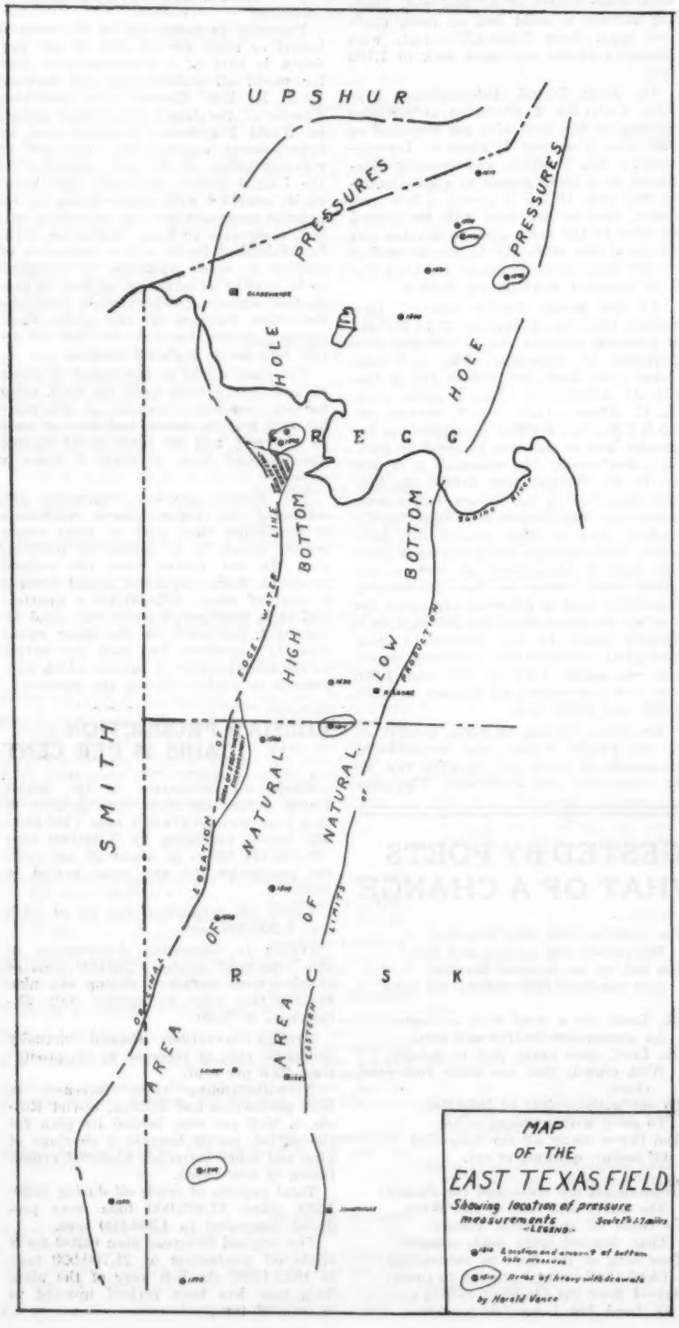
By Harold Vance and Verne Fagin
Petroleum Engineers, Vance-Fagin Engineering Co., Kilgore, Tex.

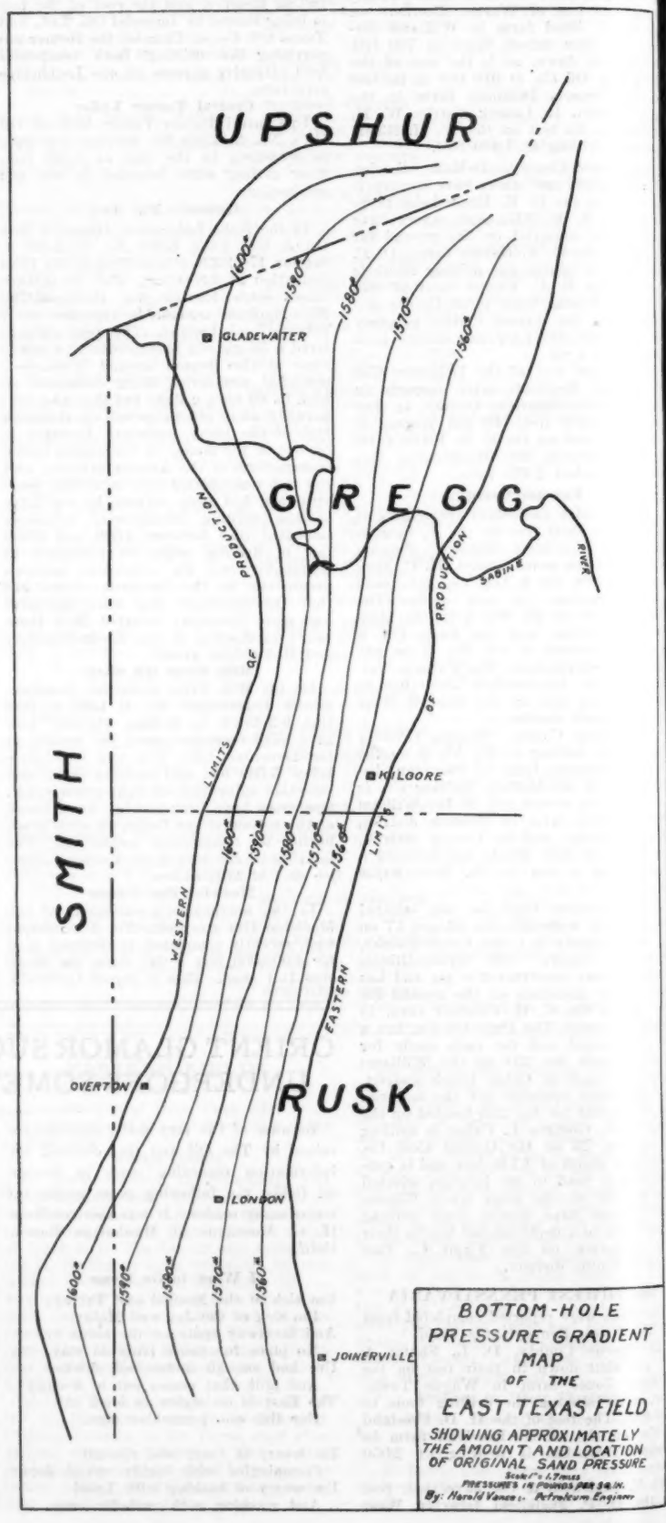
The subject of bottom hole pressures recently has been given considerable thought due to results obtained by the use of improved instruments for recording pressures within the well. The Amerada Petroleum Corp. has perfected an instrument which is giving very satisfactory results.

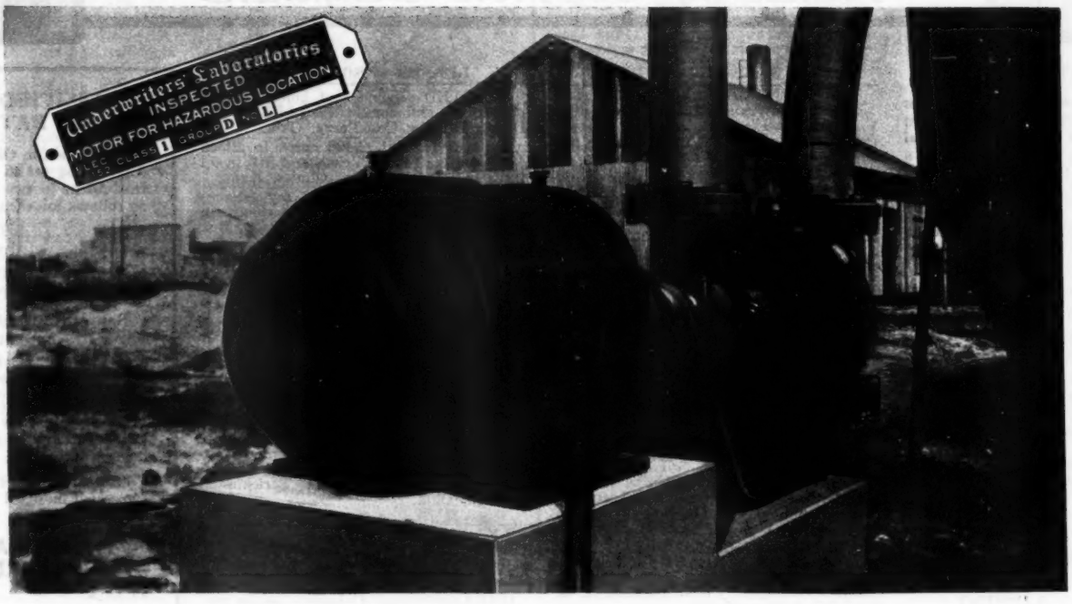
An instrument of this type has long been needed by the oil industry. A further improvement will be the recording at the surface of the bottom hole pressure opposite the sand. By the use of an instrument of this improved type it will be possible to control reservoir pressure in all fields. However, results obtained by the use of the present instrument with the proper interpretation of the results will lead to very close control of reservoir pressure.

Original reservoir pressures in any field will conform very closely to structural conditions. Therefore, in order to properly interpret the results obtained in measuring bottom hole or sand pressures a very detailed map showing contours on top of the producing horizon is necessary. For example; in the East Texas Field a wide range of bottom hole pressures were found. In some cases these pressures represent very closely the original reservoir pressure, while others are the result of drop in pressure due to withdrawals within an area of low porosity. Due to structure alone the reservoir pressure throughout the East Texas Field varies as much as 60 pounds. Higher formation pressures are naturally found in the structural lows with low formation pressures in the structural highs. This difference in formation pres-

(Continued on Page 76)







The Cost of a Building Saved

through the use of this Explosion-Proof Motor

APPROVED explosion-proof motors are being used more and more throughout the petroleum industry. Especially are they saving costs and eliminating hazards in the refineries. The Allis-Chalmers motor illustrated above, driving a gasoline pump in the Waggoner Refining Company's plant at Electra, Texas, saved the cost of a brick building with concrete floor and fire wall between pump and motor. It provides a drive that has the complete approval of the Underwriters' Laboratories.

Mechanical details of this motor are described in Leaflet 2125A. May we send you a copy?

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

CLASSIFIED WANTS

Read by Oil Men Everywhere

RATES

The rates for Classified Advertisements are 35 cents a line for the first insertion and 25 cents a line for each additional insertion. Six words usually constitute a line. The following table will enable you to figure the cost of your advertisement:

	1 time	2 times	3 times	4 times
3 lines	1.05	1.80	2.55	3.30
4 lines	1.40	2.40	3.40	4.40
5 lines	1.75	3.00	4.25	5.50
6 lines	2.10	3.60	5.10	6.60
7 lines	2.45	4.20	5.95	7.70
8 lines	2.80	4.80	6.80	8.80
9 lines	3.15	5.40	7.65	9.90
10 lines	3.50	6.00	8.50	11.00

Compute white space at the above rates.

For rates on Classified DISPLAY see opposite column.

Mail your Classified Advertisement to

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

FOR SALE—EQUIPMENT

FOR SALE for a low price. A gasoline powered Sullivan Diamond Core Drill. Write Box E-492, The Oil and Gas Journal, Tulsa, Okla.

OIL located before drilling. Geophysical method. Topgodometer Instrument; take pay in oil. No oil, no pay, except traveling and testing expenses, 95 per cent accuracy. O. P. Coffin, Caddo, Tex.

200 Amp. Lincoln Arc Welded 220/3/60. Practically new. Price $425.00. 100 Amp. Federal Butt Welder; 220 V. 60 cy. Complete. Excellent condition. $500.00. 12"x14" Chicago Pneumatic Air Compressor. $350.000. 46"x18' Niles Lathe, Quick change; $1,250.00. Also, large stock of lathes, shapers, mailing machines, pipe machines, bolt threaders; etc. Send for our list. Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West Second St., Cincinnati, O.

USED EQUIPMENT FOR SALE

Casing, Linepipe, Boilers, Engines, Compressors, Derricks, Tanks, Separators, Rig Irons, Pumps, Gasoline Plant Equipment, Fittings, Valves, etc.
Low prices and quality merchandise.

USED EQUIPMENT COMPANY
1510 Philtower Bldg.,
Phone 5-3263
TULSA, OKLAHOMA

FOR SALE

Complete Machine and Blacksmith Shop. Lathes, Shaper, Steam Hammer. All machinery and equipment in excellent condition. Shop building, bunk houses and land included. Earned about $25,000 last year. Located in big oil field; priced low to sell. Address Box E-701, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—One Armstrong spudder No. 25 special. Traction with part string of tools all in good shape, good for 1,500 ft., bargain for quick sale. O. M. Brooks, Box 433, Albany, Texas.

FOR SALE—One 4-inch U.G.-1 Worthington 3-stage centrifugal pump—with 9⅝-in. dia. impeller base and coupling. At bargain price. Address Box E-600, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—EQUIPMENT

FOR SALE

100-h.p. Fairbanks-Morse type Y, style V, semi-Diesel oil engine, new factory cylinders, new lubricator, new heads and new bearings, overhauled at a cost of $1,600 by the maker; price $2,000 on car Kansas City, Mo. Sonken-Galamba Corp., 64 N. Second St., Kansas City, Kans.

EQUIPMENT WANTED

WANTED TO BUY one used set of official A. P. I. Cable Drilling Tool Joint Master Gauges size three to five inch. Answer Box E-561, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

NEED SOME MORE GOOD CORRESPONDENTS in every city of United States and Canada to co-operate with me in selling producing and nonproducing royalties. Write, James R. Haynes, Grantville, Kans.

LAND, the source of all wealth, the only safe investment, all royalty—on structure—new survey adjoining location—oil fields—Oklahoma County—best geology—three 40-acre tracts—one 40 sells in $100 shares. Geo. W. Seckman, Edmond, Okla.

BLOCKS OF ACREAGE for test well in Bell County, Texas, and adjoining counties. Geologically recommended. A. L. Monteith, Belton, Texas.

$8.00 buys deed part oil 10 ac., Okla. County. Many wells now drilling. Joe Milam, Dept. A-B, Oklahoma City, Okla.

$12.50 Buys deed part oil 2 Oil Royalties City Pool. Ed Milam, Dept. 24, Oklahoma City, Okla.

SAFETY FIRST

You can own, control, highly profitable production and sale in natural gas. Small capital starts you. $2,000 or $3,000 ample. Proven acreage. Excellent market, four public utility pipe lines buying. Four producing sands, deepest only 600 feet. Write H. B. Buddenborg, Parker, Kans.

GOLD MINING PARTNERSHIP

Organized to reopen old gold mine in South. Can use few more partners. $500 each required and willing to work. J. W. Tudor, care American Institute of Mining Engineers, 29 West 39th St., New York City.

FOR SALE—160 acres Northwest Gulf-Cranfill well, Crane County, Texas. Address Land Owner, 222 Roosevelt Ave., Bellevue, Ky.

WITH $10,000 CAPITAL—Believe can make a profit of $100,000 in six months time trading in commodities. Time is here now. Years of experience. GREGG SNYDER, care James E. Bennett & Co., 25 Beaver St., New York City.

MONEY RAISING

DO YOU NEED MONEY for organizing or financing oil or mining deals? Write 2443 N. W. 12th, Oklahoma City.

CORPORATE ORGANIZING AND FINANCING
BROOKWORTH,
110 East 42nd St., New York.

JAMES E. MILLER CO. will co-operate with responsible firms or parties seeking aid in financing projects of higher order. Suite 200, New Brady Hotel, Tulsa, Okla.

JOHN MORRIS, 3608 WARREN ST., PHILADELPHIA, PA., invites full facts first letter from capable parties planning negotiation of reasonable capital support for undertakings distinctly of higher order. Use registered mail, safeguard data.

FINANCE YOUR OWN project with shares bonded. Quickest, most satisfactory known method of raising capital. Information free. Bankers Interstate Security, Electric Bldg., Denver, Colo.

CAPITAL: An exp. dependable broker will aid in financing projects of merit. Amster Leonard, East Orange, N. J.

INCORPORATIONS

CHARTERS — Delaware best, quickest, cheapest, most liberal. Free forms. Colonial Charter Co., Wilmington, Del.

LEASES—PRODUCTION

WANTED seismic shot holes, shallow production and core drilling. Ritter and Dugan Drilling Co., Perry, Okla.

LEASE for Oil, 2,400 acres in Block A, Coke Co., Tex. $5 cash and $15 in oil and gas. Joseph Manz, Olmitz, Kans.

WILL SELL PART of my 80-acre lease near well starting in southeastern Oklahoma. Address RAY FARBRO, Box 934, Texarkana, Tex.

FOR SALE—Sec. 8, Blk. 38, Andrews Co., Texas. Midway Hobbs and Ogden Pools. 4 miles west Penn et al Wilson well which made heads. Geology good. Lease paid this year. Clears $220 per year in rentals. 10-year lease with 6 years to run. $3,000 cash. W. T. Stiles, Floydada, Texas.

EDDY COUNTY, NEW MEXICO
Oil and Gas Leases
I offer tracts 40 acres up to 640 acres at very close prices and solicit inquiries from brokers, oil companies and investors. Address Frank Strickland, Sapulpa, Okla.

LEASES AND ROYALTY in area of Tubbs Crane Co. and Wurtz Ector Co. wells. C. H. C. Anderson, Linz Bldg., Dallas.

GREASEWOOD, Colorado, leases for sale. Good block leases for well and small bonus. Box 127, Orchard, Colo.

WAYNE GAS FIELD

Steuben County, N. Y., wells producing high priced gas at shallow depth. Cost about $3,500 to complete. Few dry holes. Get into this sensational field and develop production quickly. We are offering favorably located leases at $2.50 up per acre. 100 to 2,500-acre blocks. Quick action essential. Wire for maps today. ATLANTIC SEABOARD NATURAL GAS CO.
Wellsboro, Pa.

BOOKS

TEXAS TODAY; Great book, 366 pages, 1,297 subjects, 43,241 facts, about Minerals, Manufacturing, Railroads, Highways, Land, Waterways, Climate, Products and Resources of all kinds. Large state and highway maps. Price $1 prepaid. Amos Poe, Andrews Bldg., Dallas, Tex.

GEOLOGICAL SURVEYS

DOODLE BUG
INSTRUMENT SURVEYS

Extensive research and observation of the phenomenon developed promising methods of application. Interpretation of areas by revolutionary technique. Field work and interpretation by competent geologist. Surveys as low as $5 per section.
Allen Miller, Box 276, Edmond, Okla.

ROYALTIES—PRODUCTION

JAMES B. McANALLY

Speculative and Investment Royalties

Hunt Building, Tulsa, Okla.

Service to dealers, Oklahoma, Kansas and East Texas.

PRODUCTION, and nonproducing gas royalties, Stevens County, and Panhandle fields, Kansas, Oklahoma and Texas royalties. Special service for brokers. List and maps. James R. Haynes, Grantville, Kans.

New well starting three miles south production Joiner Pool, no dry holes between; 25-for-1 chance next few weeks. E. Croft, Proctor, Texas.

CLASSIFIED DISPLAY RATES

The rate for Classified Display Advertising set in similar style to this Ad or in two Column style is as follows for each insertion:

1 inch	1 Time	$5.00
1 inch	13 Times	4.50
1 inch	26 Times	4.00
1 inch	52 Times	3.50

Rates for Classified without display shown on opposite column.

One point borders and ten point capitals are allowed, larger type not accepted.

Changes in copy must be in our office 10 days in advance of publication date.

Mail your advertisement to the Largest Classified Section in the Oil Industry.

THE OIL AND GAS JOURNAL
TULSA OKLAHOMA

ROYALTIES—PRODUCTION

FURNISHING A REAL SERVICE

to the people of the northern and eastern metropolis who are interested in the oil industry—since 1920.

J. A. Wolf
OIL ROYALTIES
208 So. LaSalle St.
Chicago, Ill.

PRODUCING ROYALTIES
Specializing in East Texas
John L. Dickson, Box 1037, Tulsa, Okla.

ROYALTY INVESTORS, DEALERS AND SALESMEN

Absolute dependence can be placed with us on well selected royalties. Our service includes BUSINESS PRODUCING literature and all necessary details. Address Box E-581, The Oil and Gas Journal, Tulsa, Okla.

WONDERFUL OPPORTUNITY FOR A ROYALTY COMPANY

Will sell Royalty Interests in 100,000-acre spread or more already assembled, aggregating over 500 tracts in EAST TEXAS and other PROMINENT AREAS. Proper terms might be arranged if necessary. For further particulars write

G. T. Blankenship
916 Petroleum Building
Oklahoma City, Oklahoma

AM SPECIALIZING in the sale of gas production and gas royalties in the Texas Panhandle, the largest gas field in the world. Thirty years in business here and my business is good. Learn the reason. Wire or write E. B. Reeves, Alanreed, Gray County, Texas.

BUY PERPETUAL ROYALTY in POTENTIAL OIL TERRITORY, West Texas and watch developments. Tax free $2 per acre up. H. D. Wilcox, 112 Pine Ave., Long Beach, Calif.

Crude Oil Contracts Urged for Stabilizing Big Eastern Oil Pools

The Tide Water Pipe Co. and other crude oil buyers in the Bradford and Allegany Fields in McKean County, Pennsylvania, and Cattaraugus and Allegany Counties, New York, cut the price of crude oil in those two fields 10 cents per barrel on October 15, reducing it to $2 per barrel. The cut was due largely to the lowering of the pipe line rates in the more southerly districts of the Pennsylvania grade fields, which drew the Bradford-Allegany price cut out of line with that of the middle and southerly districts. When the reduction in price was announced it was thought by oil men outside the Pennsylvania grade fields that overproduction in the Bradford and Allegany Fields was responsible. Advices from Bradford are that the recent increase in production had little if anything to do with the cut in price.

In the week ending August 22 Bradford produced 22,427 bbls. a day and Allegany 6,343 bbls., a total of 28,770 bbls. per day. The output increased steadily in both fields until it reached 29,002 bbls. in Bradford and 7,860 bbls. in Allegany, a total of 36,862 bbls. per day. The increase was 8,092 bbls. per day. The average daily increase in the four weeks ending October 10 over the previous four weeks was 4,303 bbls. a day. Even at $2.15 per barrel, Bradford-Allegany producers are receiving more for 1,000 bbls. per day than Mid-Continent producers receive for 3,000 bbls. of crude oil of 40 degrees gravity or over. To get this price they have kept production down to demand. It is as easy for the operators in the two fields to produce 20,000 bbls. as 20,000 bbls. without the drilling of a new well. They could produce 80,000 bbls. or more if they were to put on an intensive and sustained drilling campaign.

The cut in the price may have no effect on the plan for taking a potential test of all leases in the 107,000 acres comprising the two fields which the producers started to do and meant to keep up through October. There has been practically no drilling in the field in 18 months which has resulted in decreased production on many of the smaller properties and it is now believed that many of the larger properties are without additional potential production. There remain many farms on which the drilling had been intensive but from which little crude has been produced during the period of proration and the reserve is practically confined to these farms, which are not numerous and possibly represent not in excess of 15 different owners. A check of these farms has shown there is up to 1,000 acres fully developed from which very little crude has been lifted. These properties present a difficult problem at this time since if they would offer all their crude, an excess production would undoubtedly exist. On the other hand, if their production is restrained and additional drilling is started by those who are now lacking production, another embarrassing situation may result.

In the opinion of an observer one of the most fitting ways in which these problems can be overcome would be by the various purchasing agencies writing crude contracts with producers that would specify the number of barrels to be purchased daily. Considerable effort and progress is being made along this line and the feeling is prevalent that in the Bradford area these contracts may shortly have sufficient coverage to prevent an overproduction, yet at the same time result in sufficient production to meet the demand.

Such a plan if put into effect would permit sufficient drilling on leases where drilling would be necessary to maintain the required production.

NEW YORK STUDYING NATURAL GAS RATES

NEW YORK, Oct. 17.—The New York State Public Service Commission inaugurated its investigation into the natural gas industry of the state last week with the taking of statistical and geological testimony relative to the production transportation, sale and utilization of natural gas in the state. The initial hearing was held in Albany.

The testimony at the opening session was mainly for the purpose of providing a background for future hearings, according to announcement by Charles G. Blakeslee, counsel for the commission, who said that the investigation would deal with financing, rates, regulations and practices in the natural gas industry.

Commissioner George R. Van Namee presided at the opening hearing, witnesses being R. H. Nexsen, deputy chief engineer of the commission, in charge of the division of gas and electricity; W. J. Fitzpatrick, chief accountant, and W. E. Henning, assistant gas engineer.

The hearings will be resumed on October 23.

NEW BOOK FOR OPERATORS

The University of Oklahoma Press, Norman, Okla., has issued a book compiled by Prof. Harry C. George, director of the school of petroleum engineering of the University of Oklahoma entitled "Oil Well Completion and Operation," that will be welcomed by the engineers in the industry for ready reference. The book deals with the completion and operation of wells and with equipment and methods used in producing or lifting oil to the surface. It includes a description of ordinary well equipment and production practice, and discusses the means of detecting various production troubles, their cause and effects, and methods of prevention and remedy.

Mechanical difficulties encountered in producing oil and the troubles resulting from conditions within the sand and the formations penetrated in drilling are also discussed. Other features include discussion of "cavey formations," floating sand, casing leaks, crooked holes, variations in tubing size and depths, paraffin or waxy residues, emulsions, corrosion and repressuring, together with methods of producing deep wells, practice involved in handling large quantities of water produced with the oil and methods for securing the maximum ultimate production from wells.

The book may be secured by addressing the University of Oklahoma Press, Norman, Okla., and costs $3.15 with prepaid postage to destination in this country. There is a slightly larger postal charge for copies sent to foreign countries.

SUMMARY OF STATEMENTS MADE OCTOBER 10, 1931, RELATING TO BUSINESS OF VARIOUS PIPE LINES FOR MONTH ENDING SEPTEMBER 30, 1931

Company—	Gross stocks	Runs from wells	Other receipts	Regular deliveries	Other deliveries
National Transit	749,274.20	145,864.04	999,945.38	499,112.79	594,714.41
W. Pa. P. L.	404,189.10	79,823.98	1,025,959.95	423,403.26	710,775.51
Areka P. L.	1,445,855.17	306,199.28	469,807.06	372,988.75	560,235.85
Buckeye P. L. (Macksburg)	347,122.32	277,205.53	139,134.24	234,573.66	127,018.53
Buckeye P. L. (Lima, etc.)	2,778,403.92	82,263.82	2,426,933.47	1,802,206.78	888,111.36
Buckeye P. L. (Cleveland)	39,616.26	12,190.61	172,545.98	1,944.16	184,060.57
Indiana P. L.	523,814.43	2,703.99	1,385,461.29	909,359.87	462,977.64
Cumberland P. L.	69,282.55	145,866.70	170.54	115,316.63	582,774.17
Southern P. L.	219,384.72	.....	224,760.00	70,732.76	137,557.33
Bradford Transit	178,031.09	413,169.77	.....	480,695.64	.....
New York Transit	108,612.34	30,392.22	131,526.80	171,412.21	.....
Northern P. L.	298,028.03	.....	456,826.31	255,413.44	241,680.83
Ohio Water Pipe	924,216.84	22,802.35	.....	465,676.13	.....
Tuscarora Dev.	11,544.91	.....	.....	500,545.93	.....
Total September 30	8,007,375.88	1,518,482.29	7,423,071.02	6,303,372.00	4,489,906.19
Total August 31	8,781,874.48	1,321,027.60	8,238,606.65	6,715,358.42	4,095,358.17
Difference	774,498.60	197,454.69	865,535.63	411,986.42	394,548.02

CLASSIFIED WANTS

ROYALTIES—PRODUCTION

BEDROCK ROYALTY PRICES ahead of drilling on major company blocks. $6 per square mile. Perpetual deeds and title warranty. Clearly stated and understandable interests. See maps and bulletins. R. R. Fisk, Box 1214-B, Wichita Falls, Tex.

WILL PAY CASH for producing Royalties anywhere. Send ful information. Merrick C. Ham, Pres., Lamont & Co., Ltd., 1107-8 Bartlett Bldg., Los Angeles, Calif.

UNUSUAL OPPORTUNITIES FOR ROYALTY INVESTORS AND DISTRIBUTORS.

THE MERCURY COMPANY
Philtower Building, Tulsa, Oklahoma.

Royalty; Leases; Drilling Contract. City Field. Big producing area. O. O. Milliken, Box 63, Oklahoma City.

MID-CONTINENT OIL ROYALTIES
Royalty Sales Company
Suite 523
105 North Clark St.,
Chicago, Ill.

HELP WANTED

SALESMAN with experience selling oilfield and refinery equipment both foreign and domestic oilfields. Box E-570, The Oil and Gas Journal, Tulsa, Okla.

POSITIONS WANTED

LAWYER, SPECIALIZED EXPERIENCE in Texas land titles and corporation matters, desires connection with oil company or law firm. Box 638, Austin, Tex.

LAWYER

36, with unusual secretarial ability, experienced in legislative, abstracting and title work, rapid typewriter operator, shorthand and bookkeeping experience, expert in English composition, past seven years assistant to president oil company, having family, desires permanent connection anywhere with corporation or individual in any capacity, references. Address Box 1064, Austin, Tex.

Refiner—Topping and Cracking Specialist. Construction experienced, 17 years best companies, best reference. Address Box E-601, The Oil and Gas Journal, Tulsa, Okla.

SALESMAN, graduate engineer, with a good sales record, desires position where technical knowledge an advantage; references. Write Box E-700, The Oil and Gas Journal, Tulsa, Okla.

OPERATOR AND PRODUCER

Experienced in drilling and managing properties, financing operations, buying production and royalties, and leasing in Rocky Mt. and Mid-Continent areas, desires position. Young college graduate who possesses character, initiative and ability. Address Box E-602, The Oil and Gas Journal, Tulsa, Okla.

POSITIONS WANTED

9 YEARS experience oil absorption, compression and charcoal plants. Loading rack to superintendent. Write Box E-571, The Oil and Gas Journal, Tulsa, Okla.

DRILLING AND PRODUCTION

Superintendent, with experience in geological, scouting and land departments desires position as assistant or in charge of operations. Graduate Engineer. Box 2317, Amarillo, Texas.

NATURAL GASOLINE PLANT ENGINEER. Fourteen years experience on West Coast and in Mid-Continent fields. Antique and modern, plant and equipment, design, construction and operation. At present unsatisfactorily employed. Not particular as to location of employment. Excellent credentials. Last five years in executive capacities. Age 36. Address Box E-572, The Oil and Gas Journal, Tulsa, Okla.

HOTELS

NEW BRADY HOTEL, TULSA, OKLA.
Tom Wilson, Mgr.
Fireproof, remodeled, new management. Free parking. Prompt, courteous service. Rates $1.00 up. Private baths $1.50.

OIL INDUSTRY PRINTING

OIL FIELD LEGAL BLANKS

Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

HOUNDS

HUNDRED COONHOUNDS. Foxhounds. Rabbithounds. Blueticks. Redbones. Blacktans. Supply Catalog. Beckennels, A-47, Herrick, Illinois.

AGENTS WANTED

NEW PATENTED DRYLEG RAINCOAT, just the coat for oil men. Send breast size, height and weight with $5 for wonderful new coat. Salesmen wanted for every oil field, samples free. GENERAL RAINCOAT FACTORY, PARKERSBURG, WEST VA.

PATENT ATTORNEYS

REGISTERED PATENT ATTORNEYS
United States and Canada
Before disclosing your invention to anyone, send for blank form.
Evidence of Conception
Bulletin "How to Establish Your Rights" and complete information free.
LANCASTER, ALLWINE & ROMMEL
Suite 418-815, 15th St., N.W.,
Washington, D. C.

FOR SALE—MAPS

M-A-P-S

We have the only complete line of general area, lease ownership and oil development maps in East Texas.

Prices on Request

ZINGERY OIL MAP CO.
Fair Bldg. Fort Worth, Tex.

COST PER INQUIRY—

We have just published a folder showing what our regular classified advertisers have to say with regards to results.

Before you spend your money advertising blindly, investigate your medium.

The OIL and GAS JOURNAL
PRODUCING REFINING PIPELINE ENGINEERING MARKETING
TULSA OKLA.

SAND PRESSURE CONTROL IN EAST TEXAS FIELD

(Continued from Page 72)

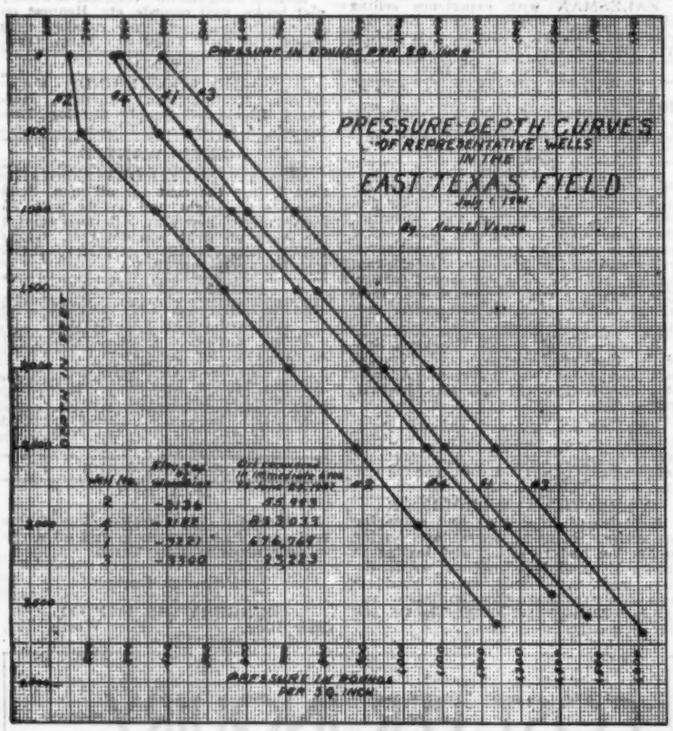
sure is due to the weight of the fluid in the sand between the structural lows and the structural highs.

Situation in East Texas

The following data pertaining to the East Texas Field must be taken into consideration in planning proper production control:

1. That the field is a common reservoir.
2. That there is a natural low gas-oil ratio in the field.
3. That there are natural low pressure areas due to structural conditions.
4. That artificial low pressure areas have been developed due to unequal withdrawals of oil.
5. That edge-water occurs on the west side of the field which is also bottom water under about one-half of the field.
6. That the water occurring below the oil may be controlled in such a manner as to increase the ultimate recovery of oil from the field.

During June and July of this year a number of well pressure tests at depths were run throughout the field and the results of these tests have been made available to the writers. Chart No. 1 shows the pressure from the surface to the bottom of the hole taken at 500-foot intervals on four representative wells in the East Texas Field.



Well No. 2 is an extreme east edge well, it is high structurally and in an area of low porosity. Well No. 3 is an extreme west edge well and in an area of high porosity. Wells Nos. 1 and 4 both from the standpoint of structure and porosity are located about half way between wells Nos. 1 and 3. All of these pressure measurements were made after the well had been shut in for 24 hours.

Reference to the curve of well No. 2 shows that there has been an accumulation of free gas in the top of the tubing. It is very apparent from these curves that well No. 2 has been producing more oil with respect to its ability to produce than the other wells shown on the chart. Well No. 4 shows somewhat the same characteristics but being in an area of higher porosity it has a greater ability to produce.

It will be noted that the pressure curves on all four wells shown on this chart are practically parallel below a depth of 500 feet. The equation for a composite curve of all four wells will be X=5; Y=6, on straight co-ordinate paper. The most significant idea to be derived from a study of this chart is that it may be possible to use the well head pressure as a close indicator of the sand pressure and that only a reasonable amount of checking will be necessary to verify the calculations.

Map No. 1 shows the locations of and readings obtained near the top of the sand on a number of pressure test run in July. The artificial low pressure areas are also indicated on the map.

Map No. 2 shows what the writer believes to be a very close approximation of the original pressure at the top of sand in the East Texas Field. The location of the sand pressures are shown by the use of contour lines. Naturally an original sand pressure map will closely resemble the structure contour map. This resemblance will be reasonably true in all fields except those in which there is some free gas within the structure itself.

Differential Pressure

In order to produce oil or gas from any well a difference in pressure must exist between the sand or reservoir pressure and the pressure opposite the sand in the well. This difference in pressure may be natural as in the case of a flowing well or it may be artificial as in the case of a pumping well. The writer has termed this difference in pressure the differential producing pressure. The maintenance of a uniform differential producing pressure throughout the East Texas Field will allow the bottom water which is present under about one-half of the field to rise in a level plane, providing the differential pressure is not too high.

Consideration must be taken of the difference in original sand pressures throughout the field if the correct differential producing pressure is to be determined. By referring to map No. 2 it will be noted that if wells are allowed to produce for example at a uniform pressure opposite the sand in the well of 1,500 pounds that wells on the east edge of the structure would be producing under a differential pressure of 40 pounds, while wells on the west edge would be producing under a differential pressure of 100 pounds. This method of production will allow unequal withdrawals from the field.

Hydrostatic Pressure

Reservoir pressure within an oil field is due to gas pressure or hydrostatic pressure or a combination of both. The East Texas Field is primarily a hydrostatic pressure field and if the hydrostatic pressure is high enough, pressures throughout the field will equalize if the field is shut in for a sufficient length of time. During the recent shutdown period there was a fairly uniform pressure increase at the bottom of the holes of 10 pounds per day in the artificial low pressure areas.

A well's ability to produce in comparison to another well is dependent upon the sand pressure and the ability of the oil string to take care of the flow providing other factors such as porosity, saturation and penetration are the same. Thus we find that in the East Texas Field west edge wells are often the largest wells. With the allowance for a field based on potential tests alone we will find wells which should not be allowed to produce much oil on account of their proximity to water, are the wells with the highest allowable.

If the allowance for the field is based on an equal amount per well we will find wells operating at different differential producing pressures which will cause high and low areas to develop in the level water table.

In order that all pressure readings may be used in comparison the pressure at the top of the sand should be taken with the utmost care.

The writer believes that from the standpoint of waste the control of the allowable should be based upon sand pressure control and not upon acreage, potential production or an arbitrary figure per well.

ROCKY MOUNTAIN AREA

(Continued from Page 45)

after being down several months and is drilling below 1,000 feet.

Niobrara County

Indian Petroleum Co.'s No. 1, NE NW NE, Section 7-35-65, Lance Creek, is bottomed at 4,175 feet and underreaming at 4,160 feet.

Converse County

John Ackard's No. 1 Morton, SE, Section 24-33-72, north of Douglas, is drilling at 1,685 feet in a soft and sticky formation.

Natrona County

Midwest Refining Co.'s No. 11 Middy, C NE NE, Section 23-35-79, Midway Dome, again failed to get a test of the Muddy sand. It will be redrilled for the fourth time to the Dakota and cemented back to the casing above the Muddy. Water from below broke in again.

Western Producers, Inc., is starting a shale well on Consolidated Royalty Oil Co. holdings in its No. 1, SW SW, Section 27-40-79, on the west side of Salt Creek. Shale production is expected at around 1,900 feet.

Summitt Oil Co.'s No. 1 Trewitt, NW cor., Section 21-33-80, North Platte, is bottomed at 1,400 feet and underreaming the 8¼-inch to shut off water.

Wyoming Imperial Oil Co.'s No. 1 Quintet Oil, NW SE, Section 13-33-79. Country Club district, near Casper, has rig completed and is ready to spud. Cylde Brennan has the contract. It is a short distance from a test drilled on the Carlson ranch several years ago by H. V. Meabon.

Park County

Midwest Refining Co.'s No. 24 Rosenberg, NE SE NE, Section 26-58-98, Frannie Dome, is bottomed at 2,926 feet is sand, presumably the top of the Embar. At this depth the 8⅝-inch was set and plug is being drilled out. A well at this location will prove up an extension of the pool on the west.

Resolute Oil Co.'s No. 1, NE SW NE, Section 17-57-101, Badger Basin, the deepest well in the Rocky Mountain area, is flowing 50 bbls. a day from a total depth of 8,725 feet. Two additional wells are to be drilled on this structure with rotaries, starting late this fall or early next spring.

Washakie County

Ohio Oil Co.'s No. 1 Strothers, SW SE NW, Section 19-45-92, Neiber Dome, is drilling at 7,875 feet in the Mowry shale above the Dakota. It probably will go to the Sundance. It is through the Frontier sands in which were found shows of oil and gas but not considered commercial, and some water.

Carbon County

Prairie Oil & Gas Co.'s No. 1, SE SW SW, Section 29-27-89, Bunker Hill, is drilling at 5,552 feet in blue shale. The first Frontier was cut at 4,891-5,130 feet, the second Frontier at 5,221-63 feet and the third Frontier at 5,400-65 feet. The cores showed gas and some oil saturation. The hole will be drilled to 6,190 feet and cased and operations suspended until spring.

Producers & Refiners Corp.'s No. 4 SW cor. SE, Section 7-26-89, Wertz Dome, is drilling at 3,405 feet in shale. This is an old hole being deepened from 3,389 feet. Same company's No. 7, Section 7-26-89, is building rig. This well was completed at 3,658 feet in 1929 as a gas well. It gauged 40,000,000 feet and later was drilled to 3,688 feet.

Producers & Refiners' No. 3, Section 3-25-88, Mahoney Dome, is plugging to abandon. The 10-inch has been ripped at 1,500 feet. This is an old gas well.

Midwest Refining Co.'s No. 27 Union Pacific, NW SE SE, Section 11-20-81, Elk Mountain, is drilling at 3,985 feet in dark brown shale.

Fremont County

Kinney-Coastal Oil Co.'s No. 1 Chatteron-Weeks, C SW NE, Section 22-3n-1w, Pilot Butte, is bottomed at 3,631 feet and preparing to test the Muddy sand which showed 12 feet of saturated sand in the cores. The 8¼-inch was set at 3,540 feet and drilling out is in progress. This well is lower on structure than its No. 1 Dykeman, half a mile to the southwest, which was completed two years ago as a big gasser.

Ward Oil & Gas Co.'s No. 1, NE cor. Section 28-34-90, Dutton Basin, is bottomed at 2,500 feet and lowering pipe to shut off cavey ground. It has cut two sands in the Frontier, the second having a show of oil and gas in the top followed by water. It is believed the hole is still in the Frontier formation.

Sweetwater County

Vermillion Oil Co.'s No. 1 State, SW cor., Section 16-12-99, Hiawatha Dome, has resumed drilling after cementing the 6⅝-inch at 4,685 feet.

Uinta County

Park City Oil & Gas Syndicate's No. 1 Christianson, NE cor., Section 6-15-113, Lyman district, set 4½-inch at 2,725 feet to shut off salt water encountered at 2,172 feet. The formation has changed from shale to sandy lime.

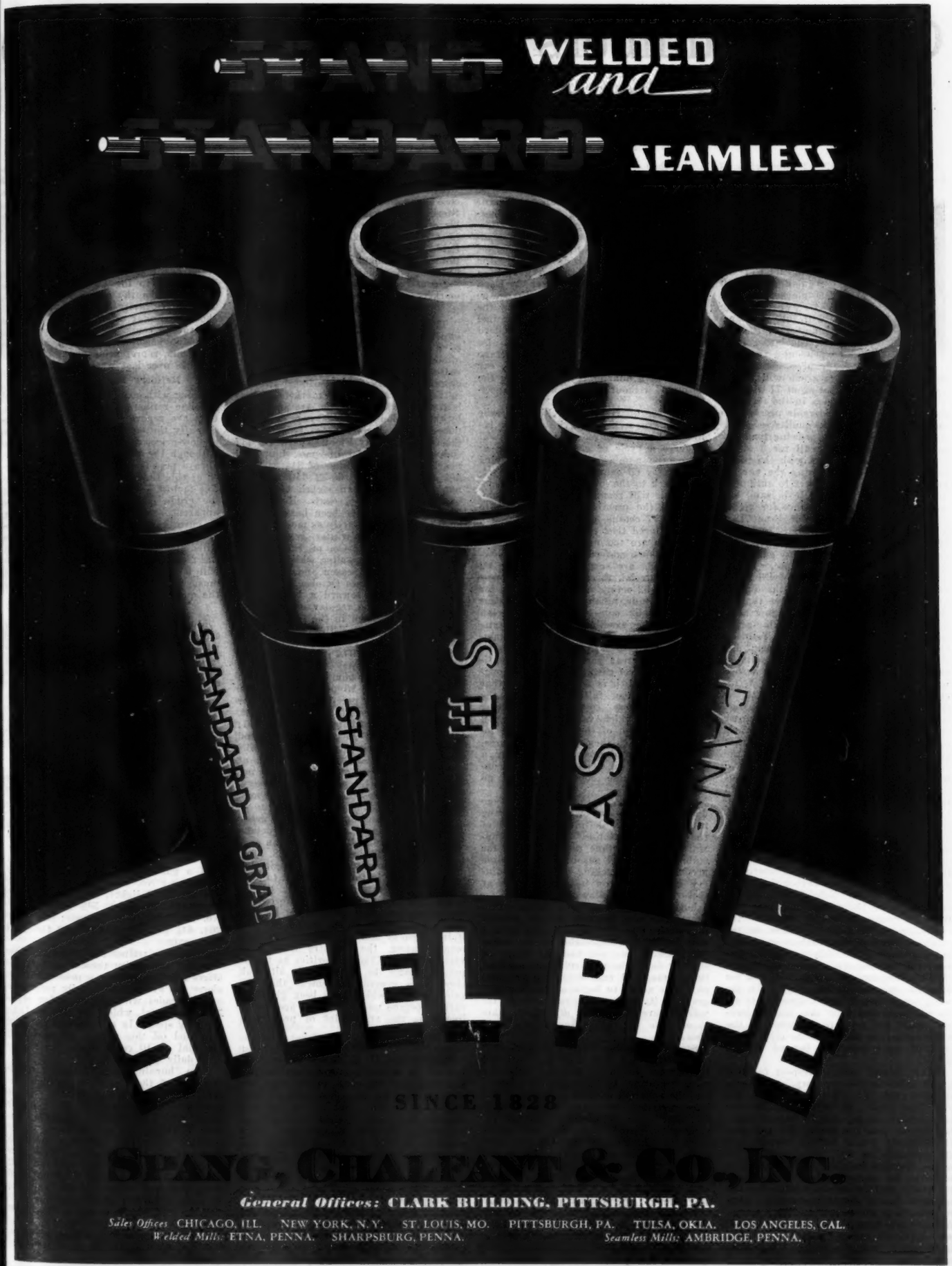
MONTANA

Glacier County

Two near completions were reported in the Cut Bank gas field. L. B. O'Neil, trustee's No. 1 Peterson, C, Section 23-35-5w, cemented 6¼-inch at 2,680 feet and is ready to drill in. A later report, unconfirmed, says this well was drilled in with an initial production of 10,000,000 feet a day. It is 2¼ miles south of the nearest producer and extends the proven area that distance. O'Neil's No. 1 Tetrug, CSL SW, Section 26-36-5w, set the 8¼-inch on top of the Sunburst at 2,741 feet and was showing 4,000,000 feet a day from the top of the pay. A later, but unconfirmed report, says it was drilled in and completed for 11,000,000 feet per day. It extends the proven area a little more than half a mile to the northeast. The field is now proven for about 5 miles in one direction and 4 miles in the other. The initial open flow gauge of the 12 wells completed, not including the two last named, is more than 165,000,000 feet a day. The field is being developed to supply the Montana Power Co.'s natural gas system to Butte and Helena, which recently was completed.

The status of the O'Neil drilling operations is as follows: No. 1 Whetstone, C SE NW, Section 10-35-5w, drilling at

(Continued on Page 81)


WELDED
and
SEAMLESS
STANDARD
SPANG
STEEL PIPE
SINCE 1828
SPANG, CHALFANT & CO., INC.
General Offices: CLARK BUILDING, PITTSBURGH, PA.
Sales Offices CHICAGO, ILL. NEW YORK, N.Y. ST. LOUIS, MO. PITTSBURGH, PA. TULSA, OKLA. LOS ANGELES, CAL.
Welded Mills: ETNA, PENNA. SHARPSBURG, PENNA.
Seamless Mills: AMBRIDGE, PENNA.

Octane Numbers Main Topic in Chicago

Thought Regular Grades May Be Established at 70 With Premium Grades Running About 77. Refiners Considering Costs

By Robert C. Conine

Chicago Bureau, The Oil and Gas Journal, 6 North Michigan Ave.

CHICAGO, Oct. 19.—Technologists of several of the major oil companies operating in this territory hold it as a practical certainty that gasoline in the territory will continue to be bettered in respect to octane rating until the regular grade will be marketed at the service station with an octane number of 70. One of the larger independent refiners expresses the opinion that the premium grade will be advanced to an octane rating of 77 at least.

It is felt that refiners in the territory are experiencing considerable pressure to step up the antiknock quality of their product, and there is a growing tendency in certain quarters to call for a showdown among the refiners with the possibility in view of stabilizing the various grades of gasoline in respect to antiknock quality. These interests, it is said, are seeking to avoid a costly race for higher octane ratings. It is pointed out that while the refiners will promptly find their operating costs greatly increased the result in the end will be that the customers will bear the additional expense.

Eventually, it is said, there will be an extremely wide gap between the quality of the third-grade gasoline and that of the regular grade. With the higher antiknock value demand in the regular grade calling for the utmost in the refiner's cracking facilities and straightrun distillation of choice crudes, the quality of the price competition grade will suffer, while in the premium grade the tetraethyl lead requirement may reach the maximum. The average motor car engine, it is further pointed out, will encounter serious knock trouble with motor fuels much below 60 octane number, so that most customers will be forced to buy the regular grade of 70 octane number and will pay for a gasoline considerably better than they need. If the prediction that the premium grade will have an octane rating of 77 or better materializes, it is expected that certain automobile manufacturers will be encouraged to make another attempt in the matter of higher compression ratios. It will be remembered that one such attempt ended disastrously a while back because of carbon deposit.

The head of the technological department of one of the major companies says that his company would welcome the establishment of a set of limits on the octane ratings of the various grades of gasoline marketed in this territory. However, this technologist assured the writer that his company has ample facilities for engaging successfully in a race with the other companies if called upon to do so. It was indicated that this major interest would not hesitate to follow if the other companies advanced the octane ratings of their gasolines beyond certain limits.

"The current lows in respect to antiknock value in the territory," this technologist said, "are 52 octane number for the third grade, 61 octane number for the regular grade, and 74 octane number for the premium grade. We feel that the industry would be well served, and the customer as well, if a limit of 55 octane number for the price competition material, 64 octane number for the regular grade, and 74 octane number for the premium grade should prove acceptable to refiners in the territory. These octane ratings are better than those current, and mark, in my opinion, the margins upon which profitable refinery operation can be carried out."

Another official, in charge of the refining department of one of the larger independents, feels sure that this major company will be drawn into an "octane rating war." According to this authority nearly all of the refiners in the territory will be forced to bring out a regular gasoline with an octane number of 70, at least. This, it is held, will be the belated appearance in the territory of a movement which has swept over the East. In Ohio, where gasoline with an octane rating of 68 to 70 is marketed as the regular grade, the third-grade motor fuel has been introduced recently by Standard Oil Co. of Ohio. This company has also brought out a gasoline of 60 to 65 octane number which it offers in the tank car market at a quarter of a cent above the gasoline without octane number specification.

In those quarters where higher octane ratings are seen as inevitable it is believed that the third-grade gasoline will undergo a cycle of changes, starting at 52 octane number and possibly moving as high as 65 octane number before settling back to the lower fifties. The regular grade will remain at 70 octane number and the premium grade will go to at least 77 octane number, it is believed. It is believed that the current price differentials are too narrow in the octane specifications materials and the following spreads are suggested: For the 62 octane material, three-quarters of a cent above the 52 octane number gasoline; for the 70 octane number gasoline, 1 cent above the 52 octane number material, and for the gasoline above 70 octane number, 2 cents above the 52 octane number gasoline.

Where a great variation in the antiknock quality of gasolines is most strongly discouraged, it is freely admitted that the refiner must fall in line with the policies of those companies marketing motor fuels which vary in composition with the season of the year and the localities in which they are sold. At present all of the companies are selling a "winter grade" of gasoline, but it is contended that these companies must go further.

At three large refineries in Chicago district installations which are being made point to a definite acceptance of the "seasonal gasoline," and to the upward trend in octane ratings. Units for stabilizing natural gasoline and gasoline produced from cracking plant and refinery gases will soon be in operation at these refineries. Following a test run on a huge installation at one of the plants a short time ago, another refiner ordered four such units. One thing is certain and that is that the depression in the refinery markets has not had the effect of slowing down the modernization work at the plants, and one of the larger companies is about to begin a building program at its Chicago district refinery involving several millions of dollars. This is not one of the refiners mentioned above.

Stronger Gasoline Tank Car Markets

Gasoline tank car markets continued to advance in price Monday reflecting more confidence in the crude oil markets and the apparent attitude of refiners who have curtailed their runs to stills. It is felt that those refineries which are resuming operation after the long shutdown in Oklahoma fields will not seriously affect the growing strength in the gasoline tank car markets. The cooler weather has brought a close to the phenomenal demand which marked the summer months. In the matter of gasoline stocks in the country, these are around the lowest levels expected and are held by many to represent a bare working volume. It is pointed out, however, that modern refinery facilities can run these stocks up much more rapidly than would have been possible in the past.

Up to Monday, Chicago oil trade circles expressed confidence that Gov. Ross Sterling of Texas will be able to enforce his order paring production at each well to 165 bbls. daily in the East Texas fields in spite of federal court injunctions and the dicta of the Texas Railroad Commission, and this sentiment is working constructively in the refined products markets, especially the motor fuels.

High Tests in Demand

The high-test gasolines are growing in importance in the tank car markets. Up to a week ago these materials figured almost exclusively in special orders. One reason for the good price position of these gasolines has been the continued strength in the natural gasoline markets. These latter markets, apparently, are unaffected by the addition of some 60 cars daily produced as the result of the reopening of the Oklahoma City Field. The 64-66 437 endpoint blended gasoline moved upward nearly a cent to a range of 3½ cents to 3¾ cents, and the 50-52 450 endpoint naphtha advanced an eighth of a cent to 3⅛ cents and 3¼ cents. Refiners in Chicago district have been heavy buyers of natural gasoline lately as most of them are offering their winter grade motor fuel. Standard Oil Co. of Indiana has been marketing a gasoline which is closely adjusted to the season and locality in which it is sold since October 15.

The movement toward a better gasoline offered at the regular grade pumps in Chicago is shown in the following exposition of characteristics of a "new" gasoline:

Octane number, 64.7; gravity, 60.1°; color, white; doctor, sweet; corrosion, negative; dissolved gum per 100 c.c., 0.4 mg.; initial, 94°; 10 per cent, 146; 20 per cent, 190; 30 per cent, 227; 40 per cent, 253; 50 per cent, 274; 60 per cent, 286; 70 per cent, 314; 80 per cent, 355; 90 per cent, 362; 95 per cent, 393, and endpoint, 397. Percentage over: at 140°, 8.5 per cent; at 212°, 26 per cent; at 221°, 28.5 per cent; at 284°, 55.5 per cent; at 392°, 94.5 per cent. Recovery, 95.5 per cent; residue, 1 per cent; loss, 3.7 per cent.

A test of this company's regular grade several weeks ago showed an octane number of 57, initial of 112, and an endpoint of 427. The gravity was 58.

There is somewhat more agitation among refiners in Chicago district to drop gravity specifications altogether. It is urged that emphasis be transferred to the percentage overhead at a set temperature, say 128° F. In the matter of classifying three or more gasolines as to their octane rating, the industry is still at variance among the authorities as to the proper ranges to be selected, although there is a general agreement that the price spreads which have been given on various octane number ranges are out of line from the standpoint of production costs.

Gasoline Tank Car Markets

Monday the U. S. Motor grade gasoline of no octane number specifications was quoted at 3⅝ cents to 3⅝ cents, an advance over the preceding week of five-eighths of a cent. While this advance matches the swift upward movement of an earlier ill-fated improvement, there seems to be little fear that refiners will be tempted to flood the market with material. There is good reason to believe that if the market reaches 4½ cents and shows firmness at that level there will be a general advance in the tank wagon markets and this will serve as a strong stabilizing factor. It appears, therefore, that sellers and buyers who have been hoping for a tank wagon advance to bring up the tank car markets have been sharing a vigil with perhaps more influential forces which demand higher tank car markets before considering action in the tank wagon prices.

The 60-62 gravity 400 endpoint gasoline is offered at from 3½ cents to 4 cents, an increase over last week's low of a quarter of a cent, and a half cent above the high. This material had already made a considerable advance, in comparison to the U. S. Motor gasoline market, when the cooler weather set in. The 64-66 gravity 375 endpoint material shows a similar advance being offered at 4⅛ to 4½ cents. The 68-70 gravity 380 endpoint gasoline is offered at 4½ to 4¾ cents, representing about half a cent increase over last week's quotations.

Refinery Buying Continues

Along with steady purchases of natural gasoline refiners operating in this territory are reported to be taking up consistently the comparatively small volume of low-price gasoline which is moving. Although the threat of the underseller is always present, his influence is discounted at this time because of such constructive factors as the return to normalcy in the crude oil production situation, the apparent strength of the forces looking to curtailment of production to an approved allowable, the decreased runs to stills, and the obvious fact that now that the motoring season is over the refiners will be able to move less gasoline and must therefore obtain a better price for the quantities they do sell.

Kerosene Markets

More kerosene is reported to be moving although the prices remain unchanged with 2 to 2⅛ cents for the 41-43 water white material, and 2¼ to 2⅜ cents for the 42-44 water white kerosene. Refiners are cutting their heavier distillates with this material and numerous sellers are staying out of the open markets so that the price is not the result of competitive conditions, unless the inroads made by the third-grade gasoline are considered.

Fuel Oils and Gas Oils

Fuel oils and gas oils continue to firm up at current price levels with advances expected some time this week or next. One of the larger distributors has announced that, effective October 24, it will advance its tank wagon postings on Nos. 1, 2, 3 and 4 oils half a cent a gallon, and the Nos. 5 and 6 oils a quarter of a cent a gallon. The present tank wagon prices are: No. 1 (38-40), 6 to 7 cents; No. 2 (32-36 light), 5½ to 6½ cents; No. 3 (32-36 dark), 5¼ to 6¼ cents; No. 4 (28-30), 5 to 6 cents; No. 5 (24-26), 4¼ to 5¼ cents; No. 6 (18-22), 4 to 5 cents.

One major refiner has withdrawn from the spot market on these materials, and offers to old customers a price of 5 cents above the average of a daily publication on all grades with the exception of the 28-30 material which is reserved for cracking stock. In the place of the 28-30 zero fuel oil this refiner offers a 30-32 material at 10 cents above the average of a daily publication.

Zero burning oils feature in the strength of these markets as there has been a heavy demand on the part of householders desiring to fill up their tanks. The spot market business, however, is completely overshadowed by the contract movement. Offerings are much fewer and it is evident that there is no surplus here. In the fuel oils the 18-22 gravity material is quoted at 30 to 35 cents a barrel, 22-26 fuel oil is 32½ to 40 cents a barrel; 28-30 zero fuel oil is 47½ to 52½ cents a barrel. The 32-36 industrial gas oil is 1½ to 1⅝ cents; the 32-36 zero gas oil is 1⅝ to 1⅞ cents, and the 38-40 straw distillate is 1⅝ to 2 cents.

Fuels and Gasoline Reduced in East

Bunker and Diesel Oil Quotations Lowered 10 Cents Barrel With One-Fourth to One-Half Cent Cut in Gasoline

By A. E. Mockler

New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street

NEW YORK, Oct. 19.—Reductions of 10 cents per barrel in posted prices for bunker "C" and Diesel oils and one-fourth to one-half cent a gallon in U. S. Motor gasoline for domestic movement featured the East Coast market during the past week. The reductions in fuel oil and Diesel oil were made effective October 16 and gasoline October 17 by the Standard Oil Co. of New Jersey. The remainder of the market in refined products underwent little change during the week with the exception of paraffin wax. Prices for the latter product were fractionally lower reflecting a curtailed demand.

The cut in bunker oil and Diesel prices came rather unexpectedly, the trade having looked for a firmer trend in these markets, owing to the fact that refiners are now contracting for these oils for 1932 delivery at maximum prices 35 cents per barrel over the new low price levels. The extreme "top" quoted by refiners, it had been believed, presaged better things for the general market, although European competition, which has been the determining factor in recent price revisions in fuel and Diesel oils, has remained virtually an unknown factor.

Standard Oil Co. of New Jersey has taken the lead in making a seasonal adjustment of the tank car gasoline price in the East with a reduction of one-half cent per gallon in its posted price for U. S. Motor gasoline, bringing the market down to 5½ cents per gallon, f.o.b. refinery terminals, in tank car lots. The New Jersey company's price for its "Standard" gasoline, which runs above 65 octane rating, is now 6 cents per gallon, one-fourth cent under the previous level. While the other major companies, up to the time of writing, have not followed in the decline, and some still quote up to 6¼ cents, other sellers are already meeting the Jersey company's price, and formal announcements of reductions are expected within a few days.

With refiners giving heed to the recommendations of the statistical committee of the A.P.I. for curtailment of crude runs to stills and production of principal products consequently on the decline, the statistical position of the eastern market has been showing steady improvement, and with a continuance of the status quo in other principal refining centers the belief is growing that the industry will go into the winter season with markets for the principal products fairly well stabilized.

Considerable interest was aroused in market circles by last week's report indicating that Sun Oil Co. was planning to extend its gasoline pipe line to Lake Ontario, opening up the entire Great Lakes territory to its marketing operations.

While little has been heard concerning the progress of the Keystone Pipe Line Co., Atlantic Refining's gasoline pipe line subsidiary, it is understood that considerable progress has already been made on the line's construction, which will further intensify marketing operations in the territory served by the line.

Cooler weather has brought out a better call for premium gasolines, refiners report, and gallonage on the Ethyl blends and other premium motor fuels is starting to record an upward curve on the sales charts.

Continued stability in the refinery gasoline market is making for a firmer feeling in tank wagon markets, and with price cutting on the part of independent marketers at a minimum, the retail end of the business continues on a favorable basis.

Gallonage has been fairly well maintained throughout the week in most sections of the territory, and marketers are optimistic regarding the possibility for maintenance of a fairly high sales level right into the winter months.

Premium fuels are generally posted at 2 cents over the price for the ordinary motor quality, and more business is being booked on the higher priced product. An interesting development in the Eastern market in recent weeks has been the almost complete elimination of stress on so-called third grades of gasoline at retail stations, and the general move toward the specialization on third quality motor fuel appears to have halted, temporarily at least, in direct contradiction to the almost general trend among local marketers as recently as two months ago.

There were no price changes recorded in tank wagon and service station markets in East Coast territory. Principal markets in most instances have now been brought up to the general level of posted prices, and barring any sudden break in the refinery price structure, some marketers in this area are inclined to look for a continuance of present price levels in retail sales for the balance of the year.

Fuel Oil

The cut of 10 cents per barrel in posted prices at New York, Norfolk, Baltimore, Charleston, Boston, Baton Rouge, New Orleans, Cristobal and Balboa, effective October 16, came somewhat as a surprise to the trade, and was a reflection of continued sharp foreign competition.

Contracts for bunker "C" oil for delivery over 1932 have been written in considerable volume by major marketers, the contracts calling for delivery at prevailing prices, with a "top" of 95 cents per barrel next year, which is 35 cents per barrel over prevailing price levels locally. While the top price of 95 cents per barrel named for the coming year is, in the final analysis, merely a precautionary step to safeguard buyers, the fact that sellers set the price limit for the year at so high a figure indicates that some hopes for a substantial recovery in the market position during 1932 are entertained in important market circles.

There has been but routine movement of bunker oil locally during the week, although the cut to 60 cents per barrel on Friday stimulated business somewhat. Contrary to earlier beliefs, the cancellations of transatlantic sailings during the winter season by a number of lines has not reacted as seriously against bunker oil business as had been feared, as many of the vessels which are skipping a few of their regular transatlantic runs are being placed in the short cruise service out of New York, and are thus doing all of their bunkering here.

Demand for industrial fuel oil has picked up somewhat during the week under review, and more of this oil is now being used in commercial heating installations. Refiners look for a steady drain against current surplus holdings as this consumption shows a seasonal broadening. Curtailment of refinery output of fuel oil, it is expected, will contribute further to this strengthening in the statistical position of fuel oil.

Diesel Oil

Spot quotations were lowered 10 cents per barrel on October 16, the same ports being affected as outlined above in the case of bunker "C" fuel oil. Diesel oil on spot is now quoted at $1.30 per barrel, in bulk, f.o.b. refinery terminals, with the usual extra charge for lighterage alongside within the harbor limits.

Diesel oil contracts for 1932 delivery are being booked at a top of $1.65 per barrel, a fair amount of business having already been placed on the books of major companies.

Gas Oil

Business was on the increase, and 28 plus recycled oil was steady at the posted price of 4 cents per gallon, in tank car lots, f.o.b. refinery terminals.

Gas manufacturing companies were drawing stocks in larger quantities, and there was a fairly heavy movement of low grade gas oil for delivery to jobbers against domestic heating oil contracts.

Lubs

No further price changes developed in the cylinder oil market last week, but a steady undertone was maintained, and prices held at recently advanced levels. Eastern cylinder oil refiners have succeeded in putting their house in order, from the standpoint of stocks and current output, and the market has reflected to the full this betterment in the statistical position.

Stocks of bright stocks, it is reported, are unusually small for this season of the year, and with production continuing on a curtailed basis refiners are optimistic regarding a continuance of present price levels, and even further increases in quotations, during the balance of the current year. The price outlook on other cylinder oils, it is stated, is just as favorable.

Tank car movement of red and pale oils has shown a little increase, and the market is steady and unchanged on all grades. A slight pickup in consumption during recent weeks indicates a quickening of industrial activity in many lines. Textile oils, however, have slowed down a little, due to curtailed consumption incidental to labor disturbances in some branches of the silk knitting trade.

Kerosene

Cooler weather has brought out an appreciable increase in kerosene gallonage at refinery terminals, and the tank car market for 41-43 water white is steadying at the posted level of 5 cents. In some sections of the territory, where shipments from Pennsylvania refineries can be made on a competitive basis, there has been a little shading of this figure.

Tank wagon kerosene gallonage has likewise reacted to the more seasonable weather, and tank wagon delivery departments of the various marketers have been quite active. There were no changes in posted prices for tank wagon deliveries in local territory.

Paraffin Wax

There has been a slight upturn in the market for white crude scale, and 122-124 a.m.p. is now generally held at 2 cents per pound, against a previous range of 1⅞ to 1.90 cents per pound for this grade. Refiners, it is understood, are well sold up on this grade at the moment.

Buying interest in fully refined grades continues to lag, however, and the market is softer on several grades. Spot 120-122 a.m.p. is offered at 2¾ cents per pound, off an eighth, with corresponding reductions shown on 125-127 a.m.p. at 2⅞ cents, and 130-132 a.m.p. at 3⅜ cents per pound. Domestic buyers continue to operate on a hand-to-mouth basis and export demand has been lacking.

With refiners reducing their runs, however, an early cut in wax production is indicated, and refiners are not inclined to book forward delivery wax at current price levels.

Domestic Heating Oil

Marketers report considerable activity in the furnace oil market, cooler weather throughout the territory having stimulated the demand considerably. The refinery market for 32 gravity minimum domestic heating oil continues quoted at 3½ cents per gallon in tank car lots and jobbers are reported ordering forward shipments in good volume.

The retail end of the market remains steady, with gallonage on the increase and prices unchanged. Current quotations on 36-40 gravity furnace oil range 7¾ to 9 cents, according to delivery point, with 36-36 oil at 6½ cents, 28-32 at the same level, 24-26 gravity at 5 cents, 18-20 gravity at 4¼ to 4¾ cents, according to quantity, and 14-16 industrial heating oil at 3½ to 4 cents, according to quantity and delivery point. Gallonage during the current season is expected to run into record high totals.

Export Market

Quiet trading ruled in the Gulf market. The three part cargoes for France, reported in the market the previous week, were closed during the week. On Monday of last week, 3,000 tons of this business (calling for 64-66 375 endpoint) was still open, with buyers insisting on quotations firm f.o.b. Houston. One of the East Texas independents is believed to have taken the business, at an undisclosed price.

From a price standpoint, the Gulf market was rather uncertain. A firm offer was reported at 4 cents for 64-66, 3¾ cents for U. S. Motor, and 3¾ cents for water white kerosene, all f.o.b. Gulf. Prime white was nominally quoted at 3½ cents, with 390 and 400 endpoint gasolines nominal at 3¾ to 4 cents.

No additional cargo inquiries were reported at the Gulf last week.

Panuco crude was quoted at 46 cents per barrel, plus taxes, with no cargo trading reported.

There was some buying interest shown in Venezuelan crude, but with sellers rather firm at 56 cents per barrel, tidewater, there was no cargo business reported placed during the week. French refiners are expected to come into the market for crude for shipment over 1932, but it is uncertain as yet whether this business will go to the American Gulf, to Venezuela, or elsewhere.

Petroleum Exports

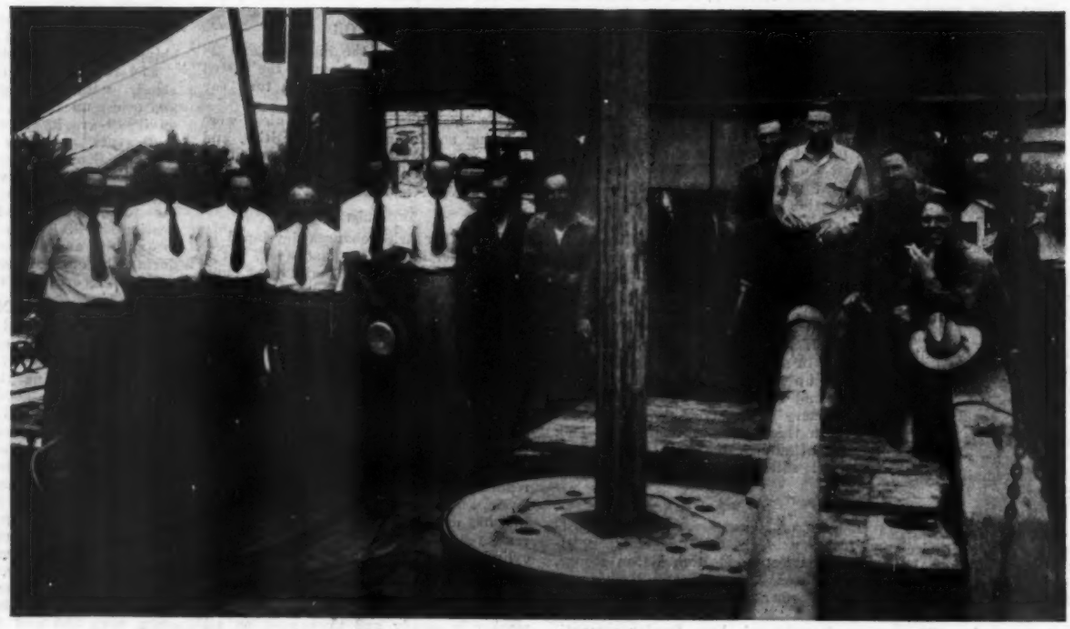
Volume of export sales in the local market continued rather limited, with foreign buyers drawing stocks as needed, and continuing disinclined to stock for future requirements at present levels.

The following table shows principal exports of refined petroleum products from the port of New York for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Oct. 10	Oct. 3	Sept. 26
Gasoline	356,000	10,000	217,000
Naphtha	480,000	183,000	125,000
Kerosene	95,000	16,000	60,000
Fuel oil	18,000	385,000	27,000
Lub oil	810,000	1,150,000	1,295,000
Pet., refined	850,000	410,000	440,000
	Pounds		
Petrolatum	6,000	48,000	80,000
Paraffin wax	990,000	1,170,000	2,300,000
Refined	350,000	100,000	.....
Scale	400,000	110,000	650,000
Lub grease	650,000	890,000	1,040,000

Further price declines in the Gulf gasoline market have tended to develop an easier feeling in the local export market for cased gasoline and naphtha, and prices have reflected the lower basis at the Gulf. Principal exporters of cased petroleum products here continue to adhere

UNION ROTARY LINE ON No. 1 LEVERICH AT OKLAHOMA CITY



TRADE MARK

The men in the picture, left to right:

Jas. A. Undercofler, Union Wire Rope Corp.
Ed. S. Rankin, Manager, Jarecki Manufacturing Co.
Paul White, Attorney
Henry Rosenthal, Contractor
Sam Springer, Contractor
G. R. Hayes, Tool Pusher, Rosa Spring Drilling Co.
Dick Rhodes, Driller
G. S. Hayes, Fireman
Dick Teel: Derrickman
W. H. Brumley, Floorman
Bob Brumley, Floorman
W. H. Schleymeyer, Floorman
Bob Mason, Floorman

The Oklahoma City field has been like other oil districts in one respect—UNION Wire Lines have won preference by serving long and well . . . From selecting raw materials to testing the finished rope, all processes in the manufacture of UNION Wire Lines are under our own supervision and subject to tests at every step to maintain the uniformity which assures dependable service.

Above photograph shows the Phillips Petroleum Corporation's No. 1 Leverich, in Sec. 10-11-3—Rose Spring Drilling Company, Contractors.

UNION WIRE ROPE CORPORATION
GENERAL OFFICE, OIL COUNTRY SALES AND EXPORT OFFICE:
3 North Madison Avenue, Tulsa, Oklahoma
Branch Office and Warehouse: Portland, Oregon — Factory: 21st and Manchester, Kansas City, Missouri — Parker-Abbott, Inc., Distributor, San Francisco, California
JARECKI MANUFACTURING COMPANY
Mid-Continent and Eastern Oil Fields Distributors . . Stocks at All Stores

UNION WIRE LINES

to their policy of quoting prices on these products only on direct inquiry.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended October 10 totaled 1,790,000 bbls., a daily average of 255,714 bbls., compared with 1,215,000 bbls., a daily average of 173,571 bbls. for the previous week and a daily average of 221,464 bbls. for the four weeks ended October 10. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	Bbls.
Baltimore	287,000
Boston	183,000
New York	689,000
Philadelphia	210,000
Others	316,000
Total	1,685,000
Daily average	240,714
At Gulf Coast Ports—	
New Orleans and Baton Rouge	40,000
Port Arthur and Sabine district	65,000
Total	105,000
Daily average	15,000
At Atlantic and Gulf Coast Ports—	
Total	1,790,000
Daily average	255,714
Daily average four weeks	221,464

Distribution of total imports is as follows:

	Bbls.
Crude	1,032,000
Gasoline	301,000
Fuel oil	457,000

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended October 10 totaled 332,000 bbls., a daily average of 47,428 bbls., compared with 389,000 bbls., a daily average of 55,571 bbls. for the previous week and a daily average of 51,321 bbls. for the four weeks ended October 10. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast Ports—	Bbls.
New York	155,000
Philadelphia	114,000
Others	38,000
Total	307,000
Daily average	43,857
At Gulf Coast Ports—	
Total	25,000
Daily average	3,571
At Atlantic and Gulf Coast Ports—	
Total	332,000
Daily average	47,428
Daily average four weeks	51,321

Distribution of total California oil receipts is as follows:

At Atlantic Coast Ports—	Bbls.
Gasoline	307,000
At Gulf Coast Ports—	
Gasoline	25,000

Shipments of California refined products for Atlantic and Gulf Coast ports during the week included the following cargoes:

For New York: 77,000 bbls. of gasoline on the E. J. Bullock.

For Philadelphia: 113,700 bbls. of gasoline on the Western Sun (Sun Oil Co.).

Charter Market

Continued dullness characterized the tanker charter market during the past week, only one domestic fixture being reported.

Shipping operators were looking for the closing of one or more clean tankers for Gulf/France movement, but it was expected that foreign boats would have the call on this business.

The week's fixture follows:

Steamer Carabulla (American) 3,105 net, Tampico to Philadelphia, 17 cents, October loading.

CLEANING OLD WELLS INCREASES EARNINGS

(Continued from Page 14)

graph had already been shot from 1 to as many as 12 times with fluid tamping without any appreciable results, but the sand tamped shots gave increases of about 10 times the former production.

Briefly the sand tamped or stemmed shot is prepared by first bailing the well as free of all fluid as possible before the shell is placed. For the best results a time bomb is used and the time of shooting set far enough ahead to permit all work to be done safely and satisfactorily.

If it is desired the torpedo may be covered with water after it has been placed, but this water must be carefully measured into the hole and introduced with bailer. It should not extend far above the top of the time bomb and its level will determine the position of a brush or oakum bridge next placed in the well.

To make the brush pack a bundle of small willow or other brush twigs are selected and cut to uniform lengths of about 2 feet, then wrapped tightly in burlap with just sufficient spring left in the bundle to permit it to expand to a close fit in the casing.

The casing has previously been raised so that it is not less than 35 feet above the top of the shot and the bridge will be lowered below the casing shoe by using a bailer or light string of tools, preferably the tools, for they give opportunity for more careful measurement and better control. If the water has been dumped in over the shot the bridge will be set at its top level; if the hole is dry the bridge should be at least 2 feet above the top of the time bomb.

Use Sand, Tile or Brick

Having placed the brush bridge, the next thing to do is to fill the hole with 6 to 8 feet of broken tile or brick. The size of these broken pieces should be about one-third the diameter of the casing so the best possible bridging effect will be secured.

Above the brick or tile fine moist sand is lowered in bailer and dumped so that there is not less than three times as much vertical height in the hole occupied by sand as by shell. If the shell is 10 feet long, for instance, the sand tamp will not be less than 30 feet in depth. It should be remembered that the amount of sand tamp can be insufficient if the above suggestions are not followed but there cannot be too much even though the ratio of 3 to 1 is exceeded.

Having placed the sand the well is ready for the shot and the time bomb will take care of the balance of this operation except cleaning out and it has been found that the actual amount of clean-out work under such conditions of shooting is not as great as when fluid stemming is followed.

Another new method of increasing production was described in the July 9, 1931, issue of The Oil and Gas Journal, page 17, under the title, "New Process for Cleaning Oil Wells." This article described the use of acid-heat method that has been quite effective in the Petrolia oil fields of Canada and is now being tried out in some fields in this country.

Electric heaters have been used efficiently in wells in many fields and an article dealing with this method of reconditioning was published in the November 14, 1929, issue of The Oil and Gas Journal.

Other Engineering Methods

The above methods of increasing efficiency in production by no means exhausts the list for there are many advocates of the use of the gas lift and repressuring early in the life of the field. Proper application of these principles are strictly engineering problems and should be guided by experienced men and under such conditions will be fully justified.

If gas lift is applied early in the life of the well it will aid materially in conserving the natural gas energy within the reservoir for it can be so regulated as to permit that natural gas to be used to bring the oil to the well bore and the compressed gas from the surface added in such quantities and pressures to lift the fluid to the surface. This will make for a total lower gas-oil ratio and because of the conservation of the energy within the pool will result in a final greater recovery of oil.

The repressuring of the field as followed in Sugarland, Tex., by the Humble Oil & Refining Co. is now recognized as a method that is controlling pressure drop within the sands and conserving energy and it seems only reasonable to assume that the final recovery from that field will be larger than under other methods of production.

Conservation of gas after it has reached the surface is another engineering advancement that is being applied to many fields and the gasoline is being extracted. While the prices for natural gasoline are low there still seem to be many reasons why plants should be installed in fields where there is sufficient quantity of gas to make plant operation efficient.

It is a notable fact that every major and many of the larger independent companies have very efficient engineering staffs at work upon their many problems and not only are they applying recognized technical practices but are also now giving most serious attention to the economic phase of all operations.

ROCKY MOUNTAIN AREA

(Continued from Page 76)

2,750 feet and preparing to run pipe. No. 1 Cummings, C SW, Section 22-36-5w, drilling at 2,200 feet. No. 1 McNeil, C NE, Section 23-35-5w, drilling at 795 feet. No. 1 Vermont Loan & Trust Co., C, Section 28-36-5w, rig up.

R. C. Tarrant's No. 1 Hogland, NW cor. SW, Section 13-34-6w, is drilling at 550 feet and looking for a casing point. Will cement and shut down for the winter.

Fulton Petroleum Co.'s No. 1 Blackfeet, SW NE NE, Section 28-36-12w, Milk River district, is drilling at 2,672 feet.

Carbon County

Ohio Oil Co.'s No. 1 Chapman, C SW SW, Section 2-7s-21, Dry Creek, is drilling at 4,800 feet and headed for the Dakota. There was a good show of gas in the Frontier, but it was not commercial. Same company's No. 2 Montana Industrial, C NW NE, Section 11-7s-21, is moving in materials, and its No. 2 Souders, C NE SW, Section 2-7-21, has cellar completed.

Carbon Oil & Gas Co.'s No. 1 Armstrong, SW cor. NW, Section 7-7-22, a mile to the east, is drilling at 4,982 feet in shale with the Dakota as the next objective. The gas showings in the Frontier were not considered commercial.

Liberty County

California Co. has a baffling problem in its No. 1 Eleanor, SE SE, Section 11-33-6e, Utopia distrcit. This well was drilled to 3,214 feet by the Utopia Oil Co. At that depth it had a hole full of water. There was a show of oil and gas, but no test could be made on account of the water and heaving sand from the bottom. The hole had stood in this condition for several months when the California Co. took it over. The 6¼-inch was pulled with the tools in it and after recovering tools it was rerun. Bailing sand and water continued without exhausting the latter. The hole reached a total depth of 3,244 feet, 20 feet in a sand of which 16 feet showed saturation with gas in the upper part. Continued efforts to exhaust the water which had been standing on the sand were not successful and the 6¼-inch was cemented on bottom. The plug was drilled out and the water broke in again and the pressure forced sand 1,500 feet up in the pipe. Whether this pressure is coming from a gas reservoir below is not known and a decision has not yet been reached as to the best method to overcome the trouble.

In the Bear's Den district, Liberty Gas Co.'s No. 1 Corwin, C SW SW, Section 12-36-5e, is drilling at 1,900 feet, and People's Oil & Gas Co.'s No. 1 First National Bank, C SE NW, Section 17-36-6e, landed the 10-inch at 1,285 feet and is cleaning out. G. G. Howard's No. 2 Schoonover, C SE NE, Section 13-36-5e, is drilling below 1,400 feet.

Teton County

California Co.'s No. 1 Sullivan, NW NE NW, Section 34-27-7w, Bynum district, has a caving hole at 2,134 feet and is underreaming the 10-inch to lower.

Cascade County

Buscher & Cassady's No. 1, NE cor. SE, Section 19-22-3e, Benton Lake district, is drilling below 995 feet.

Rosebud County

Prairie Oil & Gas Co.'s No. 1-XX, Contract 3, NE SW NW, Section 26-10n-39, Porcupine Dome, is drilling at 3,680 feet in broken sand. The water sand at 2,200-2,400 feet which has defied all efforts to drill through, prior to putting down this well with a rotary, flowed about 100,000 bbls. a day. Below this sand at 3,225-30 feet it had a flow of water in brown lime.

Toole County

Askalta Oil Co., Ltd.'s No. 2 Farbo, SW SE NE, Section 2-37-4w, Border Field, is drilling at 700 feet, and Oregon Oil Syndicate's No. 1 Barthoelote, SW NE SE, Section 20-36-2e, Barthelote district, cemented pipe at 1,200 feet and is cleaning out to bottom at 1,300 feet.

Pipe Line Runs

Average daily pipe line runs for the week ending October 17:

WYOMING

	Bbls.
Salt Creek	21,810
Big Muddy	1,760
Dallas-Derby	310
Dutton Creek	90
Elk Basin	700
Ferris	20
Frannie	240
Grass Creek	2,040
Hamilton Dome	940
Hudson	270
LaBarge	1,080
Lance Creek	260
Lost Soldier	3,380
Oregon Basin	1,230
Osage	1,180
Pilot Butte	40
Rock River	1,790
Poison Spider	220
Simpson Ridge	50
Teapot	10
Total Wyoming	37,420

MONTANA

Buckley-Border	520
Cat Creek	900
Dry Creek	270
Kevin Sunburst	4,330
Lake Basin	70
Pondera	1,360
Total Montana	7,450

COLORADO

Florence	360
Fort Collins	1,000
Iles	990
Moffat	870
Orchard	1,210
Rangely	20
Tow Creek	310
Total Colorado	4,760

NEW MEXICO

Rattlesnake	724
Hogback	490
Table Mesa	79
Artesia	502
Cap Rock	886
Hobbs	36,943
Jal	1,115
Lea City	1,890
Eunice	500
Total New Mexico	43,129
Total Rocky Mountain area	92,759
Total previous week	92,427
Difference	332

ERROR IN FORMULA

In the paper of R. R. Hawkins, engineer of The Texas Company, Tulsa, presented before the fall meeting of the A.I.M.E. at Houston, Tex., October 3, and published in the October 8 issue of The Oil and Gas Journal, an error was made in copying a formula.

Referring to the formula at the top of the second column:

$$P = \frac{D}{8H}$$

Where P=minimum pressure.

D=depth of well.

H=head for a given specific gravity of fluid.

Thus for a 2,500-foot well where 35 gravity oil is to be produced the minimum pressure will be:

$$P = \frac{2{,}500}{8 \times 2.7} = 115 \text{ pounds.}$$

It will be noted that the change in the formula where substitutions have been made is from "82.7" to "8×2.7," the 2.7 representing the number of feet of 35 gravity oil that equals 1 pound weight.

As 2.307 feet of water equals 1 pound on the square inch at 39.1° F., by dividing that figure by the specific gravity of the oil in question the number of feet of oil required to give 1 pound pressure per square inch can be obtained.

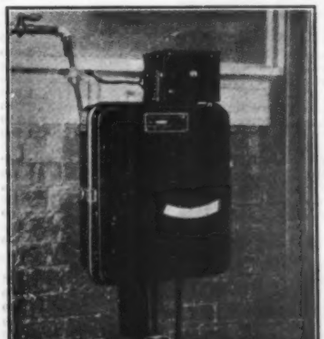
IMPROVED DISTANT RECORDING SYSTEM

(Continued from Page 24)

be measured by the milliammeter. When this phase relationship between the voltage on this plate and grid is changed, the grid necessarily becomes negative during part of the cycle, and the current flowing in the plate circuit will be cut off for a certain percentage of the cycle, depending on the phase displacement.

By changing the inductance enough it is possible to shift the phase relationship 90 degrees, and when this is the case practically no current will be flowing in the plate circuit and the milliammeter will therefore read almost zero.

Due to the fact that the current from the grid of the vacuum tube is almost nil very little current is carried by the



Transmitter mounted on pressure gauge.

variable inductance, and in practice amounts to about 10 milliamperes at 35 volts. The variable inductance also provides a low impedance path for possible induced currents on the line to leak off and be dissipated, so that they do not affect the apparatus.

Suggested Applications

A fixed inductance is incorporated in the receiving instrument which, by pressing a button on the face of the instrument, is connected in the circuit in place of the variable inductance. When this is in the circuit, and the instrument is in calibration, the receiving instrument should show a definite reading which is marked on the scale.

After long use it is possible that there may be a slight variation in the constants of the vacuum tube which are made apparent by this test. These variations can be corrected by an adjustable resistance inside the receiving instrument. In other words, if, when the button is pressed, the pointer on the instrument does not come exactly to the red mark on the scale, the variable resistance is adjusted until it does, when the instrument is again in perfect calibration. This adjustment should not require over 15 seconds to make, and should not be necessary more often than once a month.

With this system it is possible to secure remote pressure readings along a pipe line carrying gas, oil or water and the transmitter can be connected to the two wires of the telephone or telegraph system that parallel the pipe line and the small amount of current used, i.e., 10 milliamperes at 35 volts, will not affect the use of the telephone or telegraph system for their normal purpose.

If a dispatcher on a pipe line system desired to know the pressure at one of the stations along the line it would be possible to have it recorded on the receiving instrument at his desk by following the above operations and this would save time in sending and receiving written messages asking for this information. This would also be of interest to a pipe line superintendent who could have as many receiving and voltage regulator sets in his office as he had pipe lines under his jurisdiction and could then keep close check on operations.

In as much as the amount of oil or water in a tank will register pressure it is possible to use this system in recording such pressures in the central office. This idea might be carried further and application made of it to reporting gasoline or lubricating oils in bulk storage at central points and permitting the manager of a marketing department for an oil company to have a constant check of material in stock at principal points at any time.

For production superintendents the system should be of interest because there are times when it is very essential to have constant information about water available at drilling wells, especially during periods of drouth when water is accumulated in some central pond or reservoir and it would be piped to several locations where drilling is in progress. Under such a condition the superintendent could have installed in his office the recorder and the transmitter could be placed at the reservoir and the height of water behind the dam could be checked at any time and by having such knowledge always at hand planning of operations would be facilitated.

System Has Many Advantages

This system of recording pressures from distant points has many advantages as will be seen from the above description and it is understood that it can be expanded so that as many as 10 transmitting points can be included in one system and made to register on one set of recorders and voltage indicators. If a separate cable is used for this system it is possible to operate as many stations as desired because each transmitter will form a circuit and by plugging in at the receiving end of the line pressures can be read from any number of places along the line.

However, if a number of transmitting and receiving units all of which will be located at different points along the same line, that is to say, receivers being located at remote places from the various transmitters, this type of installation would be limited to a maximum of three sets. This limit is due to telephone wire characteristics and the fact that the design of the equipment will permit only three receivers and three transmitters operating over two wires at the same time.

Offsetting this one limitation of application there are numerous advantages, such as, power requirements are at the receiving end of the system only; it is impossible for sparks to occur at the transmitter since there are no brushes or contacts; there is practically no limit to the distance over which the system may be used; the device when properly adjusted is accurate to within at least 2 per cent of its reading and since the device consists of only a vacuum tube, a milliammeter, a fixed resistance, a variable inductance and a static voltage regulator it is extremely rugged and reliable. The system is not influenced by currents which might be induced in the line by extraneous influences, such as nearby high tension transmission lines.

The system maintains its accuracy to within 2 per cent even if supply voltage drops to 20 per cent below normal, or rises 15 per cent above normal.

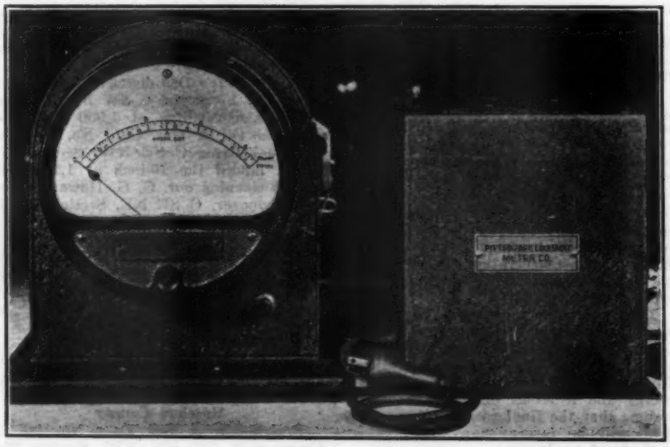
The system can be supplied for indicating pressures ranging from 10 ounces to 1,000 pounds per square inch.

While other distant recording pressure systems have been on the market for some time the Telemco System seems to present many new possibilities for application and because the transmitter is of such simple construction and actuated by a very small amount of power it can be placed in many remote places and if necessary so covered as to protect it against the elements and outside disturbances. If telephone or telegraph wires are near the transmitting end the hookup is very simple and even if it is necessary to run two wires a short distance to reach telephone or telegraph system it will be found that the many advantages to be secured by the use of this system pays for this small additional outlay.

Its use is by no means confined to the petroleum industry for it can be used for city or town water systems, for central heating plants and industrial purposes, where there are changes in pressures occurring and it is desirable to know of these changes at the central office or station.

Within the petroleum industry there seems almost endless application around drilling wells, producing properties, along gathering and main pipe line systems, in gasoline plants, and along gasoline pipe lines, in refineries where it is desirable to have information about pressures maintained in various operations transmitted to the office, and even in marketing where a central office desires to have quick reference to stocks of gasoline and lubricating oil on hand at distant points.

If further information is desired it can be secured by addressing the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., or Tulsa, and giving the following information: Location of transmitter; location of receiver; distance between transmitter and receiver; means of connection, such as telephone cable, telephone wires on poles, private line; kind of measurement, such as a pressure, vacuum, height of fluid, holders, etc.; range of measurement, that is, pressure range, etc.; and electric current available. (Voltage and cycles.)



Receiver and voltage indicator.

REQUEST RIGHT TO CONTROL PRODUCTION

(Continued from Page 18)

for conservation without unlawful restraint of trade is needed for the present and future public welfare."

Opinions may vary as to what the remedy may be, but our investigations, and extensive inquiry among the leaders of these industries, indicate that there should be no departure from the basic principles which the chamber has recognized and emphasized in previous years—namely, that any solution should rest upon the fundamental principle of preserving the initiative of the individuals of these industries, and of enabling them to exercise the fullest possible degree of self-government, and to that end government should aid and not regulate.

Without departing in the least from the principles above mentioned, the committee has reached the conclusion that the time has come to face frankly the fact that within these industries unlimited and unrestricted competition is not going to furnish a solution. Some means must be found whereby the individual units within these industries can take concerted action to control production, bring such stability as is necessary to prevent waste of natural resources, and enable them to take properly the important place they hold in American industry and in the general national welfare.

Must Control Production

Having reached the conclusion that no solution of the problem can be found which does not, in some way, make it possible for these groups legally to take concerted action to control production, the committee has focused its attention upon the problem of the relation of the anti-trust laws to such concerted action, since these laws are generally considered to be an obstacle to such action.

In proposing a measure for congressional enactment which would permit concerted action to control production, we recognize that this is not all that needs to be done to place these industries in a sound position where they will be a stabilizing instead of a depressing influence in the industrial life of the nation, but it is the belief of the committee that the legislation we propose is a necessary step in that direction.

In a word, the proposal we have in mind, is to appoint a small group of federal officials familiar with these industries who can, upon a temporary basis, authorize agreements to control production among units of industries that draw upon the resources of the mines and forests for their products, when in their judgment such action is necessary in the public interest.

Some of the steps which the committee has taken in reaching this conclusion are described below.

Deal Jointly With Oil, Coal, Lumber

The question will be asked why these three industries have been selected out of the great group of natural resources industries for consideration. A review of the activities of the department committee during its 10 years of dealing with the different problems of these industries shows there has been a natural gravitation towards a common meeting ground for dealing with their problems. In the early years of the department committee's deliberations there was little understanding by these industries of each other's problems, and each was inclined to believe that it had problems peculiarly its own which entitled it to special consideration. This committee, in fact, as its preliminary study, considered whether there were factors common to these industries which would warrant dealing with them jointly. The conclusion of the committee was that they do possess such factors in common. They may be briefly stated thus:

1. Each industry is dealing with a vital natural resource. Two of them, oil and coal, are irreplaceable, and one, timber, can be replaced only after a long time and at large expense. Developments of recent years emphasize the value to a nation of its basic natural resources and the need of their conservation and orderly development.

2. Each industry is composed of many thousands of units which are found in different fields widely scattered over the United States—in other words, they are highly decentralized industries.

3. There is such diversity in ownership and locations that it would be impossible, and from a business viewpoint undesirable, to attempt to organize these industries on a monopolistic basis. Competition exists between individuals, between regions, and with other commodities.

4. There is great excess productive capacity in each of these industries. This has brought about a chronic condition of overproduction. This overproduction

with resulting depression is not the result of the existing general depression. It is the judgment of these industries that a speedy return to normal business would not offer a solution for their difficulties.

5. The chronic condition of overproduction, with resulting depression, causes waste of natural resources, loss of reasonable returns to the industries themselves and of wages and revenue to the communities in which the operations are carried on.

6. There is almost unanimous agreement within these industries that unless some lawful means can be found whereby they can take concerted action to control production, the result means bankruptcy of many of the units, general loss to the industry as a whole, and such unsatisfactory conditions that there may be invited a large measure of government regulation with its attendant evils of inefficiency, increased costs, and undesirable social and political implications.

Physical Waste

One of the worst results of the continued overproduction in these industries, is waste of the nation's natural resources. The foundation of modern civilization is cheap mechanical power, and the remarkable material development of the United States rests largely upon our wealth in coal and petroleum. No country in the world surpasses us in these natural resources. Our forest resources have been and continue to be a source of great wealth, and aside from their direct contribution to material development, have great value to national welfare in other ways. Modern intensive methods of production, the greatly increased use per capita of natural resources in modern life, and the uneven distribution of such resources throughout the world, give them, in the opinion of many, a higher importance than at any other time in human history—particularly true of those resources which, in large measure, determine the type of our civilization.

The most striking instances of waste of natural resources occur in the oil industry, where the very liquid nature of the resource which enables one operator to draw the oil from his neighbor, forces production in excess of demand—for when once a well is sunk, the only way a neighboring owner can protect himself is likewise to drill a well. This results in a wild scramble of all owners in a particular pool to secure their shares. Then follows rapid lowering of the gas pressure and rapid exhaustion of the pool—regardless of market demand.

The condition of overproductive capacity in the oil industry today may be summed up with this statement—that if all of the proven wells in the United States were permitted to flow freely, there would be produced double the amount of crude petroleum required.

The control and conservation of natural gas pressure is today recognized as vital in bringing petroleum to the surface. Some of the figures on the wastes of natural gas constitute a sad commentary on the present situation.

A report by the gas administrator of the State of California, states that during 1930 there were produced from the oil and gas fields of California a total of 228,000,000 bbls. of petroleum, and 544,000,000,000 feet of natural gas. Of this amount of natural gas, 220,992,285,000 feet "were blown in the air and wasted." In volume, this much natural gas represents almost half of the total manufactured gas in the United States.

The report cites the reduction of wastage of natural gas from 26,000,000,000 feet in February, 1930, to 7,000,000,000 feet in January, 1931, mentions the factors as accomplishing this great reduction, "the voluntary curtailment of production in the oil industry, the curtailment agreement between the operators in the Kettleman Hills Field and the Federal Government.

Economic Waste

Physical waste is only one of the losses which result from the present condition of unlimited, unrestricted competition in these industries. There is economic waste as well. The storage of excess stocks in the oil and lumber industries, and the installation and maintenance of unnecessary plant equipment in all three of the industries involve a large loss of capital. The lack of a fair return on capital has in turn a disturbing influence on the industrial life of the nation. The waste of natural resources is directly reflected to the communities through inadequate returns of revenue to those communities. There are also serious wastes of energy through depressed wages. Social as well as industrial problems flow from these conditions.

The only outcome of such a system is a long-continued struggle out of which may emerge a few strong units. This struggle, however, will necessarily be accompanied by the bankruptcy of the weaker units and by all the demoralization which follows in the wake of a depressed industry. This is particularly serious where industries are as important as those under consideration. In fact, the argument has been advanced that the chronic instability and depression which has existed for years in these three basic industries has been an important contributing cause to the present general business depression, and that measures that would stabilize them would help greatly in bringing a return of normal prosperity to the nation, and in assuring future prosperity.

Drastic events of the past few weeks in Oklahoma and Texas, where the governors have used the militia in an effort to prevent the waste of natural resources and the economic losses which have resulted from unlimited individual competition, have brought to every citizen the acuteness of the situation in the oil industry. In years past, there have been equally dramatic events in the coal industry, mainly through strikes which were acute symptoms of the existing difficulties.

Obstacle to Effective Concerted Action

There has been much progress in coordinated activities by the units within the oil, coal and lumber industries. Fact gathering and the issuance of statistics, which received an impetus as a result of decisions in the maple flooring and cement cases, have proved of great value to industry in meeting modern economic conditions—in fact, in the judgment of many, they have saved some industries from utter collapse.

Another form of concerted action has been the trade practice conference carried on by the Federal Trade Commission. This activity is widely recognized as having afforded valuable opportunity for the units of an industry to develop, in the light of the practical experience of the particular industry, rules which are in the direction of efficiency, and are not contrary to the public interest.

We believe, however, that these measures will not afford direct and immediate means of coping with the critical situation in the oil, coal and lumber industries, nor will they offer a permanent solution. The concerted action necessary is that which can grapple directly with the problem of unlimited, wasteful production.

The real obstacle to such concerted action is the Sherman act, and this for two reasons—either actual prohibition by the act, or uncertainty as to whether the act prohibits such concerted action as a practical matter. It is necessary to recognize that although the Sherman act might ultimately be interpreted by the courts as not preventing agreements entered into in good faith, and which have for their main purpose the restoration of a reasonable balance between production and consumption in the natural resources industries, there is, in reality, so much uncertainty about the law, that there is no likelihood of such agreements being entered into at the present time. Business is too fearful of public sentiment to run the risk of public disapproval which might follow such action, regardless of its belief in the propriety and legality of such agreements. Moreover, it would take a period of years to determine the legality of such agreements, and it is obvious that prompt action is needed.

Conclusion and Recommendation

Our proposal is for congressional action which would provide for the appointment of a small tribunal of representatives of the federal government familiar with the technical and business problems of the natural resources industries, an agency that would enjoy the confidence both of the industries and of the general public. This tribunal would be authorized to determine whether a condition of overproduction, which was not in the public interest, existed in either the oil, coal or lumber industries. Upon such a finding, the tribunal would be authorized to permit the units of the particular industry to enter into agreements to control the production of its commodity entering into interstate commerce, provided the purpose was to bring production and consumption into reasonable balance, and was not primarily for the purpose of eliminating competition, establishing monopoly, or unduly increasing prices. Authority would be vested in the tribunal to terminate the agreement when, in its judgment, the purpose had been accomplished, or if the agreement were being abused.

Such an arrangement would not result in the establishment of a large permanent federal commission, and it should not result in the loss of initiative within the industries, or lead to the development of practices which would be inimical to public interest. Nor would it preclude the development of the trade practice conference, or of trade association activities. Under this provision the industries would, of course, not be prevented from adopting any of the various measures suggested for their betterment that do not require legislative aid.

We, therefore, recommend that through legislative enactment there be created a tribunal consisting of government officials familiar with the natural resources industries, who shall be authorized to find when overproduction on a scale injurious to the public interest exists, or is threatened, in any of the products of the mines or forests; and upon such finding the producers shall be authorized, with the approval of the tribunal, to enter into an agreement to curtail to a reasonable extent the production of such products entering interstate commerce; such agreement to be terminated upon the order of the tribunal when, in its judgment, the condition of injurious overproduction no longer exists.

NEW HALF CENTURY OF USEFULNESS AUSPICIOUSLY BEGUN BY "TRANSIT"

The National Transit Pump & Machine Co. of Oil City, Pa., has brought to completion its extensive program of improvement and expansion which keeps the company in line with the changes in the oil industry that have made necessary the building of larger pumps and engines.

For 53 years "Transit" has maintained a record of engineering skill and practical oil field experience, coupled with loyalty and co-operation with the industry. It has kept pace with the changes in the oil business, but always with an eye on the future. Its most recent expansion plans, which it has put into effect, have added to the plant in Oil City 124,000 square feet of floor space, provided with the latest adequate machinery to build the kind of equipment the modern oil and gas industry demands in the production, transportation and refining branches. Efficient and experienced engineers, designers and trained workmen have been added to the force.

The building program has not only provided for the manufacture of larger pumps and engines to meet the new demand, but has provided facilities to test engines and pumps under actual working conditions. Formerly large engines were erected on the customers' block in the field and tested there. Now the company will test every engine and pump under actual working conditions before it leaves the shops.

Several months have been consumed in "Transit's" building program. Eight shop buildings have been erected or remodeled and two office buildings have been remodeled. A yard craneway has been built, a chemical laboratory erected, engine and pump test blocks constructed and a track scale foundation put in.

All the buildings are the latest type of fireproof construction with adequate light and ventilation provided under all conditions. The buildings are constructed of concrete, brick, glass and steel and will be provided with modern equipment to make their utility complete.

One of the new buildings is 285 feet long and 165 feet wide and in this the huge new gas engine compressors built by the company will be assembled and tested. Another of the new buildings known as the pump storage house, is 285 feet long and 90 feet wide. A new warehouse is 190 feet long and 70 feet wide. A tool department building is 72 feet long and 85 feet wide and in addition to the foundry, measures 188 feet long and 75 feet wide.

Assembling and testing building of the National Transit Pump & Machine Co. at Oil City, one of the new structures recently added to the plant.

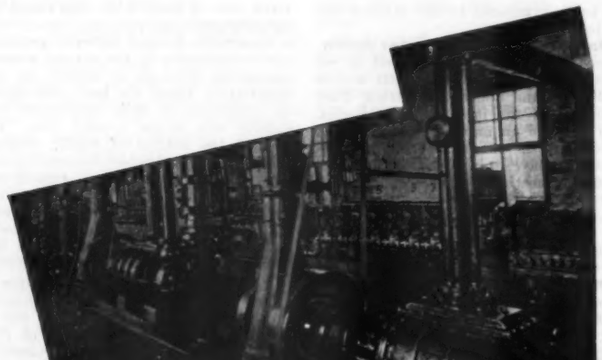
CONSERVATION OF GAS IS DECLARED ESSENTIAL

(Continued from Page 17)

in length when they had reached markets 100 miles away, but now gas is being transported to markets 1,000 miles away from the fields.

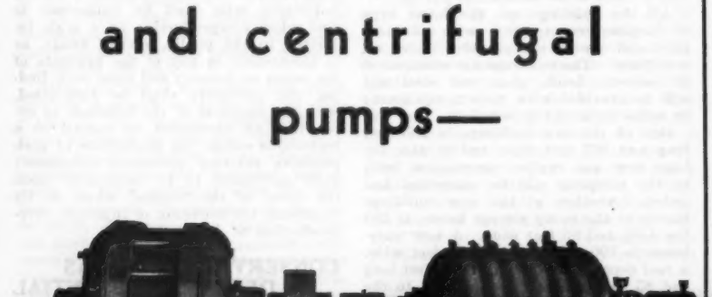
Before gas could be piped these long distances, it was necessary that improvements be made in transmission facilities. Until six or seven years ago the largest pipe lines were 16 and 18 inches in diameter, and were constructed of lapweld pipe. Gas was being transported through these systems at 300 to 350 pounds pressure. Some of the modern long distance lines have diameters as large as 24 inches and even 26 inches, and are constructed of seamless or electric welded pipe. The quality of steel used in modern pipe line construction is very much improved over that used a few years ago. Gas can now be safely transported through a modern pipe line system at from 600 to 800 pounds pressure with as great a degree of safety as it was originally transported at lower pressures.

It was necessary not only to have im-



Three of a group of five Rotary Positive Gas Pumps installed in a Western refinery.

—If you desire the greatest pumping efficiency at the lowest power cost, consider these rotary positive and centrifugal pumps—



Hayton Class H Multistage Pump

ROOTS-CONNERSVILLE-WILBRAHAM
DIVISION OF INTERNATIONAL-STACEY CORPORATION
Michigan Avenue & 14th Street
CONNERSVILLE, INDIANA
New York Pittsburgh Columbus Cincinnati Chicago Detroit St. Louis Wichita Tulsa Ft. Worth Houston Beaumont Shreveport Los Angeles Buenos Aires, Argentine

proved quality of material in pipes, but it was also necessary to build compressors, and to manufacture couplers and valves to meet the demand of the higher pressures. The engineers and manufacturers have done a great deal toward the solution of these questions, but research is constantly going on, ever seeking to transport gas at a diminished price in order to enable the industry to carry its supply from the fields to more distant markets.

The investment in these super lines is enormous, and it behooves those who are contemplating the undertaking of their construction to make the most careful study, both of the field to determine the adequacy of the supply, and to the market, to be assured that reasonable rates can be secured over a sufficient length of time to amortize the investment.

Mining Hazard

These huge investments in the pipe lines must be amortized and the money returned with reasonable profits on the investments during the life of the fields reached; or, the lines must be extended by added investments to other fields and the gas transported over longer distances to reach the same market. In this sort of an investment there is added what gas men, for want of a better term, call "mining hazard." This mining hazard consists of several different factors; that the pool or fields may not produce the gas estimated; that more gas will be wasted than was anticipated; that proper conservation laws will not be enacted or enforced; and, last but not least, that other large pool or pools may be opened sufficiently close to the markets served to render the investment in long lines valueless. All of these factors should be taken into consideration before investments in pipe lines are made.

Most of our cities are served by water works systems, which take the water from rivers and deliver it to the customer's spigot. Water does not cost anything. The consumer can take his bucket, go to the river, get the water and carry it home for himself, and it will not cost him a cent; but the water company takes it from the river, purifies it, delivers it to the customer's house where he can have it in abundance whenever he wants to turn the spigot. The same is true of natural gas. The pipe line company makes these enormous investments in pipe lines; it takes its chances in the mining hazards; it realizes that it must give absolutely perfect service. The gas is delivered through the distributing company to the customer, who can cook his meals, heat his water and his home by merely turning on the gas. He sets his thermostat and his house is kept at an equal temperature day and night during the entire winter season. He carries in no wood, he carries out no ashes, and he pays for his gas after it is consumed. The gas company has brought the wood box and the coal bin into the house, has put the fuel on the fire as it is needed, and has serviced the furnace without the least bit of work on the part of the consumer.

Cost of Service

It is this service for which the consumer pays. No one has ever heated their house with natural gas and wanted to turn back. It is a de luxe heating service not furnished by any other fuel.

The gas thus transported and sold is in competition with other fuels. It is in competition with electricity in cooking and water heating. It is in competition with coal and oil in house heating, and is in competition with the cheapest forms of fuel in industrial uses.

The householder is willing to pay a fair price for gas or electricity to cook his meals and heat his water because the cost is comparatively small, but when it comes to heating his house, he considers what form of fuel is the cheapest and will only use the preferential gas service if it is sold to him in comparative competition with these other fuels. But the service must be 100 per cent. If the gas main breaks and the householder is without fuel to heat his house in cold weather, it is not the kind of heating service he wants. Gas must be at his meter whenever, and in the quantities, he wants.

To maintain this service, the pipe lines must be kept in the very best of operating condition. Crews must be ready at a moment's notice to repair any breaks or leaks in the line. Pressure must be built up against the approaching storms, wells must be turned in, compressors must be run. The efficiency in the transportation of gas has been practically perfect, and it is this service that the customer receives. It comes to him so naturally, and is so perfect, that he does not realize the cost and the skill necessary to give it to him.

The manufactured gas company has been largely supplying the cooking and water heating services in the towns where it operates. It sells comparatively small quantities of gas per customer at a comparatively high price. The natural gas company must transport its gas in large quantities, must sell it for house heating and industrial purposes, and at a load factor which will enable him to earn a reasonable rate upon, and to amortize its investment.

Instant Supply

Where a pure natural gas service is given in a city, it is necessary to provide an adequate quantity to take care of the domestic demands in case of sudden and rapid falls of temperature. Gas may be transported at from 30 to 60 miles an hour. It will thus be seen that when it is transported 300 or 400 miles or more it will be several hours from the time the gas leaves the well until it is at the customer's meter. To take care of this increased demand, it is necessary to carry a reasonable amount of industrial gas, with proper cut-off contracts so that a stream of gas will be coming into the markets which can be diverted quickly into the domestic consumers' mains. This industrial gas must be sold, whether at a profit or not. It is a necessary incident to a proper domestic service. Again, the industrial consumers must be taken care of. It is most highly desirable that natural gas companies supply these industries with a heat service, providing oil service when it is necessary to take care of the domestic consumers. It is good business for the gas company to maintain this stand-by service, with both oil and gas burners so that they can turn off the gas and on the oil, and vice versa, when needed. Thus the industrial consumer is able to get this preferential fuel at a price he can afford to pay for it. Large amounts of gas are sold to industries which cannot be thus used. It is unfortunate, indeed, that the superabundance of gas has forced it into the markets and displaced the cheaper sort of fuel. If the gas could be reserved for the higher uses, such as domestic and preferential industrial use, the public in general would receive a great deal more benefit and over a great deal longer period of time.

Investment Problems

A great many gas ventures have been entered into where the economies of the situation did not justify them. When the banker has learned that gas can be procured in the field at such a small cost, and when transported at 100 per cent load factor can be delivered so cheaply at the markets, he thinks enormous profits can be made in these ventures and he has readily supplied the money. He does not appreciate the mining hazards which are encountered, nor does he appreciate that a number of years of experience are necessary to operate such a system; accordingly, great sums of money have been invested in pipe line ventures which will never be returned to the investors. However, when the gas supply in the fields is adequate, when reserves are procured which justify the venture, and when the pipe lines are operated by skilled and experienced operators, natural gas securities are first-class investments.

I have referred herein to the Amarillo gas field because at the present time it is the source from which three major 1,000-mile pipe lines either have been, or are being constructed.

It is not safe to build a major pipe line project from a new and untried gas field. When the gas fields of Kansas and Oklahoma were opened in the early part of the century, it was thought that they would supply the markets for from 15 to 30 years. This judgment was largely based on information secured from experiences in the West Virginia and Pennsylvania fields. However, the gas supply in

practically all of these Kansas and Oklahoma fields was exhausted in from two and one-half to three and one-half years. The pipe lines were constantly searching for new fields and new pools; rates were based on such a low level that most of the large pipe line companies were eventually forced into bankruptcy and receivership, and the public suffered from the lack of gas.

The Hugoton Field in southwestern Kansas is very large in extent and is estimated at around 1,000,000 acres, but no one can tell how much gas it will produce, nor how long it will last. It is an untried field; it has had no pull to date and, while it is generally believed that there is an enormous supply of gas there, it would be hazardous to build a major line depending upon it for its source of supply.

Study of Market

Constant study must be made of the markets in order to supply them with just the service which their particular markets or community requires. The industry must constantly strive to secure better appliances to the end that the customer may get the greatest value out of the gas sold. There is a limit below which the gas company cannot sell its gas, but markets may still be made available by its better and more economic use through improved appliances.

One of the great problems of the natural gas company today is to sell its product in such a way as to give the pipe line the necessary load factor. A domestic house-heating load is carried at a very poor load factor, as there is no demand for it during a great many months in the year. Nevertheless, the pipe line company must enter into purchase contracts with the producer and give him sufficient takes, and on a sufficiently good load factor, to induce the producer to continue drilling and supplying the pipe line with gas.

We are already at the dawning of the day when gas will be used by the domestic consumer in the summer time for house cooling, and when it will be used for building cooling in the larger cities. We may confidently expect to see the store, the bank, the office building, and even the manufacturing plants cooled by gas in the summer, as well as heated by it in the winter. When that time comes, the domestic gas load factor will be greatly improved, and it might be possible for the gas companies to reduce their rates and thereby increase their markets.

Fair Return

A commissioner in one of our western states (while discussing a rate hearing) said that he did not understand natural gas very well, but as he understood it God made the gas, the people pay for it, and the gas company gets the money. As I have said before, that idea is prevalent due to the fact that the expenditures which have been made in the wells in the field are not apparent, the transmission pipe lines are buried out of sight, as is also the distributing system. The public does not appreciate the investment that is made, the expenditures which are necessary to maintain the lines and the distributing companies in a bottle-tight condition to supply his needs, the mining hazard incident to the years.

However, the American public is fair-minded and is willing that the gas company should have a fair return upon its property. It does not want something for nothing, and I have an abiding faith that the natural gas company which has thus fortified itself with an adequate supply of gas, and which gives satisfactory service to its customers at reasonable rates, will succeed.

CONSUMPTION OF GAS INCREASED IN 1930

(Continued from Page 28)

plants; 98,842,000,000 feet, or 6 per cent, was utilized as fuel at petroleum refineries; 41,256,000,000 feet, or 3 per cent, was burned at portland cement plants, leaving 315,059,000,000 feet, or 20 per cent, for miscellaneous industrial purposes.

The use of natural gas as fuel in the field was again the most important class of industrial consumption. The quantity so used increased from 705,083,000,000 feet in 1929 to 723,165,000,000 feet in 1930. This increase was somewhat surprising in view of the declines in drilling and in the production of natural gasoline. Oklahoma, California and Texas, the three leading crude producing states, were the leading consumers of natural gas for field purposes.

Use for Carbon Black

The use of natural gas in the manufacture of carbon black, the second most important class of industrial consumption, increased from 261,107,000,000 feet in 1929 to 266,625,000,000 feet in 1930. This gain, while important, was much less than that recorded in 1929.

The total consumption of natural gas as fuel under stills and boilers at petroleum refineries in 1930 amounted to 98,842,000,000 feet, a decline from the previous year of 4,887,000,000 feet, or 5 per cent. The decline in the use of natural gas as refinery fuel was fairly general and resulted chiefly from a decrease in the quantity of crude oil processed.

The consumption of natural gas by electric public utility power plants amounted to 120,290,000,000 feet in 1930, an increase over 1929 of 7 per cent. This figure constitutes a new record for this class of consumption, although the percentage increase was much below that of 1929. Natural gas is used by public utility plants in 18 states; the two most important consumers are Texas and California.

The consumption of natural gas by portland cement plants in 1930 remained practically unchanged from 1929; the total in 1930 was 41,256,000,000 feet, as compared with 41,643,000,000 feet in 1929. During 1930 natural gas was used as fuel at 28 portland cement plants located in 10 states as follows: Alabama, Arkansas, California, Colorado, Kansas, Missouri, Nebraska, Oklahoma, South Dakota and Texas.

The heading "Miscellaneous Industrial Consumption" covers consumption of natural gas by steel plants, glass works, ice plants, brick and terra cotta establishments, and many other industries where the absolute control of temperature is absolutely necessary. A total of 315,059,000,000 feet was consumed by the miscellaneous industries, a decline of 5 per cent from 1929.

Producing Wells

The approximate number of producing gas wells, as of December 31, 1930, totaled 55,020, an increase over the previous year of 1,475. The total number of gas wells completed in 1930 amounted to 2,866, which indicates that there were about 1,400 gas wells abandoned during the year. Pennsylvania, with nearly 20,000 producing gas wells on December 31, 1930, again ranked first; West Virginia, with 12,983 gas wells, was again second. The small average size of the gas wells of the eastern states makes it imperative to have a large number of wells upon which to draw and necessitates the drilling of many new wells—thus, while the states east of the Mississippi produced only 18 per cent of the total output in 1930, they had 81 per cent of the producing gas wells as of December 31, 1930, and were credited with 51 per cent of all the gas wells brought in during the year.

The number of gas wells completed during 1930 amounted to 2,866, a decrease of 4 from the 1929 total. This figure does not include completions in California, for which State the record is lacking. However, the number of strictly gas wells in California is comparatively small. Ohio, with 653, was again the leading State in number of gas well completions in 1930. This figure represents a material decline from 1929, nevertheless, the State showed a gain of 9 per cent in output. Texas, Oklahoma and West Virginia, with 483, 403 and 397 completions, respectively, followed Ohio in rank. Of these, only Oklahoma showed an increase in production over 1929.

The interstate transportation of natural gas, has shown a rapid growth in recent years, particularly in 1929 when several large lines traversing several states were completed. In 1930, the growth in interstate deliveries was more conservative, nevertheless, the quantity transported between states showed a gain

AMERICAN PETROLEUM INSTITUTE PRESIDENT'S SPECIAL, TULSA TO CHICAGO, NOVEMBER 9th.

OIL BURNING LOCOMOTIVES ON THE FRISCO—

Arrangements have been completed for reduced rates and at hotels. Diagrams are now available for Pullman and hotel reservations. Definite room assignment will be made eliminating the necessity of registering after arrival in Chicago.

Delegates from TEXAS are extended a hearty invitation to travel with OKLAHOMA on the PRESIDENT'S SPECIAL, leaving Tulsa the afternoon of November 9th. Delegates may leave Dallas or Fort Worth late Sunday night via FRISCO LINES, spending morning in Tulsa. On your return trip you will be privileged to travel direct from St. Louis on the TEXAS SPECIAL or BLUEBONNET.

Dining and Pullman car crews who are personally acquainted with the handling of delegates for several years will be in charge, insuring the best possible service.

The Executives of the FRISCO AND ALTON Railroads appreciate the compliment in having the opportunity of again handling the PRESIDENT'S Special and will see to it that every detail is worked out in a big way.

For Pullman and hotel reservations, please call or write J. E. Payne, Assistant General Passenger Agent, Frisco City Ticket Office, Philcade Building, 'phone 3-3151, Tulsa, Oklahoma.

J. E. Payne,
Asst. Gen'l. Pass. Agent

T. B. Peake,
District Pass. Agent
Alton Railroad

FRISCO LINES

J. W. James,
Traffic Manager

INSURE YOUR FUTURE!

By reading each week pertinent literature which will improve you for your work. The Oil and Gas Journal alone covers the entire petroleum industry—it is the only complete and authoritative source of oil news. Every week technical articles appear which are invaluable to you.

PLEASE ENTER MY SUBSCRIPTION AT ONCE.
LATER I WILL REMIT [ ] $3 FOR 6 MONTHS
[ ] $6 FOR 1 YEAR

NAME _____

OCCUPATION _____

COMPANY _____

ADDRESS _____

over 1929 of 17 per cent, and for the year amounted to 380,600,000,000 feet.

The largest single interstate movement of gas was again that from West Virginia to Ohio, although the movement from Oklahoma to Kansas was almost as large. Other important interstate deliveries were those from Kansas to Missouri, from Kentucky to West Virginia, from Louisiana to Arkansas and Texas, from Texas to Colorado and Oklahoma, and from West Virginia to Pennsylvania. The states which have large quantities of excess gas over and above their consumption are Louisiana and West Virginia, hence the interstate movement from these states is large.

Pipe Line Mileage

It is difficult to estimate the total mileage of the natural gas pipe lines, chiefly because there is no definite dividing line between trunk lines and gathering lines. Furthermore, it is virtually impossible to ascertain when work on new lines was started and completed. However, it is believed that as of July 1, 1931, there were approximately 50,000 miles of natural gas trunk lines in the United States, as compared with 40,000 miles the previous year.

Although the number of large pipe line systems completed in 1930 probably fell below the 1929 record, the number of individual projects undoubtedly showed an increase and the total mileage laid was possibly higher than in 1929.

EAST CENTRAL TEXAS

(Continued from Page 25)

and the Austin chalk was cored from 3,546 feet. Sand was encountered from 3,686-89, 3,690-91 feet and 3,715-20 feet, these sands considered as dry. Subsea datum of bottom of hole is 3,324 feet, below the water table, but no water was reported by the production department, which adds to the proof that pinching the surrounding wells in to 225 bbls. per day, 185 bbls. and then down to the present daily allowable of 165 bbls. per well, has greatly improved the water situation, retarding encroachment, and benefiting the wells on the west edge. This well is one location west of the nearest producer. The lease was one recently purchased from the Mid-Kansas Oil & Gas Co. when the Tidal Oil Co. purchased all the holdings of that company in Gregg County.

Pumping Wells in East Texas
Joiner Area, Rusk County

Armstrong and Pitts' No. 1 Cooper, pumping 85 bbls, 24 hours; Ball and Malone's No. 1 Bradford, pumping 185 bbls., 8 hours; Consolidated Oil Co.'s No. 1 Camp, pumping 185 bbls, 24 hours; same company's No. 2 Camp, pumping 185 bbls., 24 hours; same company's No. 3 Camp, pumping 185 bbls., 24 hours; same company's No. 4 Camp, pumping 185 bbls., 24 hours; same company's No. 1-A Camp, pumping 185 bbls., 24 hours; same company's No. 1 Jobe, pumping 185 bbls., 24 hours; same company's No. 2 Jobe, pumping 185 bbls., 24 hours; same company's No. 3 Jobe, pumping 185 bbls., 24 hours; same company's No. 4 Jobe, pumping 185 bbls., 24 hours; same company's No. 5 Jobe, pumping 185 bbls., 24 hours; same company's No. 6 Jobe, pumping 185 bbls., 24 hours; same company's No. 7 Jobe, pumping 185 bbls., 24 hours.

C. & P. Oil Co.'s No. 1 Mayfield-Alford, pumping 185 bbls., 24 hours; same company's No. 2 Mayfield-Alford, pumping 185 bbls., 24 hours; same company's No. 3 Mayfield-Alford, pumping 185 bbls., 24 hours; Darman's (Lively) No. 1 Camp, pumping 83 bbls., 24 hours; East Texas Refining Co.'s No. 1 Ashby, pumping 185 bbls., 8 hours; Elliot Drilling Co.'s No. 1 Alford, pumping 87 bbls., 24 hours; same company's No. 1 Deason, pumping 103 bbls., 24 hours; Federated Oil Co.'s No. 1 Mayfield-Alford, pumping 185 bbls., 24 hours; same company's No. 3 Mayfield-Alford, pumping 137 bbls., 24 hours; Foster & Klop's No. 1-A Mayfield-Alford, pumping 185 bbls., 15 hours; same company's No. 2-A Mayfield-Alford, pumping 185 bbls., 15 hours; same company's No. 1-B Mayfield-Alford, pumping 185 bbls., 12 hours; Fox and Butler's No. 2 Thrash, pumping 185 bbls., 5 hours; Gibson and Johnson's No. 1 Ashby, pumping 185 bbls., 20 hours; Gilcrease Oil Co.'s No. 1 Bradford, pumping 185 bbls., 12 hours; same company's No. 2 Bradford, pumping 185 bbls., 12 hours; same company's No. 3 Bradford, pumping 185 bbls., 12 hours.

H. L. Hunt's No. 1 Ashby, no report; same party's No. 3 Ashby, pumping 325 bbls.; same party's No. 2 Ashby, no report; same party's No. 4 Ashby, no report; same party's No. 5 Ashby, no report; same party's No. 1 Bradford, pumping 40 bbls.; same party's No. 2 Bradford, no report; Joiner and others' No. 1 Bradford, pumping 80 bbls., 15 hours; K. & P. Oil Co.'s No. 1 Alford, pumping 185 bbls., 15 hours; Lide's No. 2 Young, pumping 185 bbls., 15 hours; Lide and others' No. 2 Young, pumping 185 bbls., 12 hours; Moss and Urschel's No. 1 Mayfield-Alford, pumping 30 bbls.; same parties' No. 2 Mayfield-Alford, pumping 30 bbls.; Petroleum Marketing Corp.'s No. 1 Camp, pumping 185 bbls., 10 hours; same corporation's No. 1 Frederick, pumping 185 bbls., 12 hours.

Roberts Oil Co.'s No. 1 Ashby, pumping 185 bbls., 12 hours; Rusco Oil Co.'s No. 1 Bradford, pumping 25 bbls.; Shaw Oil Co.'s No. 1 Ashby, pumping 185 bbls., 10 hours; same company's No. 2 Ashby, pumping 185 bbls., 24 hours; same company's No. 3 Ashby, pumping 185 bbls., 24 hours; Thompson and Beene's No. 1 Alford, pumping 85 bbls., 24 hours; Tidal Oil Co.'s No. 1 Tolliver, pumping 185 bbls., 12 hours; Ventura Oil Co.'s No. 1 Ashby, pumping 185 bbls., 12 hours; Wainwright Oil Co.'s No. 1 Camp, pumping 185 bbls., 12 hours; same company's No. 2 Camp, pumping 185 bbls., 12 hours; West Texas Oil & Royalty Co.'s No. 1 Talley, pumping 185 bbls., 10 hours.

Note—Wells were not allowed to flow over 185 bbls. per day as per curtailment order which limited production to that amount.

Pumping Wells in East Texas Field
Kilgore Area (Rusk County)

Madden and others' No. 1 Mayfield, pumping 185 bbls. 24 hours; Sinclair Oil & Gas Co.'s No. 1 Kennedy, pumping 185 bbls. 24 hours.

Wells Which Have Gone Dead in East Texas Field
Kilgore Area (Rusk County)

East Texas Refining Co.'s No. 1 Mayfield, Harry Elliott's No. 1 Terrell and Magnolia Petroleum Co.'s No. 5 Wells.

Wells Which Flow When Agitated
Joiner Area (Rusk County)

Anderson and others' No. 1 Frederick, swabbed 185 bbls., Juan Ximenes Survey; same company's No. 3 Frederick, swabbed 185 bbls., Juan Ximenes Survey; Bill and Dave's No. 1 Young, swabbed 185 bbls., Maria Josefa Pru Survey; Ford and Sample's No. 1 Deason, swabbed 185 bbls., Juan Ximenes Survey; Foster and Klop's No. 2-B Mayfield-Alford, pumped 185 bbls., Juan Ximenes Survey; Fox and Butler's No. 3 Thrash, pumped 185 bbls., Juan Ximenes Survey; Gilcrease Oil Co.'s No. 4 Bradford, swabbed 185 bbls., Juan Ximenes Survey; H. L. Hunt's No. 1 Bradford, swabbed 185 bbls., Juan Ximenes Survey; H. L. Hunt's No. 2 Bradford, swabbed 185 bbls., Juan Ximenes Survey; H. L. Hunt's No. 3 Bradford, pumped 185 bbls., Juan Ximenes Survey; Lide and others' No. 2 Young, swabbed 185 bbls., Maria Josefa Pru Survey; Manahan Oil Co.'s No. 1 Deason, pumped 185 bbls., Juan Ximenes Survey; Modisette's No. 1 Deason, swabbed 185 bbls., Juan Ximenes Survey; Perry-Woody-Boller's No. 3 Thrash, swabbed 185 bbls., Maria Josefa Pru Survey; Petroleum Marketing Co.'s No. 1 Arnold, swabbed 185 bbls., Maria Josefa Pru Survey; Pilot Oil Co.'s No. 1 Finney, pumped 185 bbls., Juan Ximenes Survey; Shaw Oil Co.'s No. 1 Deason, swabbed 185 bbls., Maria Josefa Pru Survey; Sinclair Oil & Gas Co.'s No. 1 Holland, swabbed 185 bbls., Juan Ximenes Survey; Sinclair Oil & Gas Co.'s No. 2 Holland, swabbed 185 bbls., Juan Ximenes Survey; Sinclair Oil & Gas Co.'s No. 3 Holland, swabbed 185 bbls., Juan Ximenes Survey; Sinclair Oil & Gas Co.'s No. 4 Holland, swabbed 185 bbls., Juan Ximenes Survey; Sinclair Oil & Gas Co.'s No. 5 Holland, swabbed 185 bbls., Juan Ximenes Survey; Sinclair Oil & Gas Co.'s No. 6 Holland, swabbed 185 bbls., Juan Ximenes Survey; Tidal Oil Co.'s No. 2 Tolliver, pumped 185 bbls., Juan Ximenes Survey; Turman Oil Co.'s No. 3 Dark, swabbed 185 bbls., Juan Ximenes Survey.

COMPLETIONS IN EAST CENTRAL TEXAS
Van Zandt County

Pure Oil Co.'s No. 4 York, initial production 108 bbls. on eleven-sixteenths-inch tubing choke, total depth 2,924 feet.

NORTH AND WEST TEXAS

(Continued from Page 26)

The Phillips Petroleum Co. advised gas producers in the South Bend Pool, southern Young County that it would cut the price 25 per cent, whereupon the producers asked the Lone Star Gas Co. to check the area for connections, and with the view of building a gathering system to take gas for domestic purposes.

The Ranger district was given a new allowable of 30,000 bbls. by the Railroad Commission in its last proration order, while the Wichita Falls district was given 57,000 bbls. per day. The former district produced 17,680 bbls. this week, the latter district produced 62,736 bbls.

WEST TEXAS PRODUCTION
Week Ending October 17

County—	No. wells	Prod.
Andrews	0	0
Crane	377	15,422
Crockett	51	1,130
Ector	78	7,503
Fisher	11	950
Garza	2	0
Howard-Glasscock	544	28,134
Irion	9	58
Jones	87	1,412
Loving	46	3,629
Mitchell	111	1,780
Pecos	549	72,804
Reagan	355	24,014
Runnels	5	65
Scurry	5	0
Upton	263	4,931
Taylor	3	56
Ward	69	3,415
Winkler	595	37,184
Total production this week		202,487
Total production last week		203,793
Decrease		1,306

COMPLETION IN RANGER DISTRICT WEEK ENDING OCTOBER 17
Brown County

Humble Oil & Refining Co.'s No. 4 E. P. and W. H. Kilgore, show oil 1,203-20 feet, swabbed 50 bbls. in 24 hours and flowed 35 bbls. in 24 hours, total depth 1,220 feet.

Coleman County

F. Lane's No. 1 T. B. Debusk, dry and abandoned, total depth 1,650 feet. Johnson-Matlock Oil Development Co.'s No. 1 J. J. Gregg, location abandoned. J. C. Shaffeo's No. 1 Shields, dry and abandoned, total depth 2,271 feet.

Eastland County

L. Teatsorth's No. 1 J. W. Cater, top pay 1,558-82 feet, estimated 20 bbls. with 200,000 feet of gas, total depth 1,582 feet.

Shackelford County

J. Jarvis and others' No. 1 W. C. Herrington, dry and abandoned, total depth 1,770 feet. Worth Petroleum Co.'s No. 1 Clark, top pay 665-68 feet, initial production 30 bbls., total depth 668 feet (recompleted). Same company's No. 2 Clark, top pay 656-87 feet, initial production 85 bbls., total depth 687 feet. Same company's No. 3 Clark, top pay 667-80 feet, initial production 12 bbls., total depth 691 feet (recompleted). Same company's No. 4 Clark, top pay 755-65 feet, initial production 20 bbls., total depth 765 feet.

COMPLETIONS IN NORTH TEXAS WEEK ENDING OCTOBER 17
Archer County

D. L. Wolf and others' No. 1 W. O. Davis, dry and abandoned, total depth 2,232 feet. R. P. Dorean and others' No. 1 Liles, dry and abandoned, total depth 900 feet.

Clay County

Ray Ling's No. 1 F. T. Wade, temporarily abandoned, total depth 2,200 feet.

Hardeman County

Chiltex Oil Co.'s No. 1 W. D. Berry, plugged and abandoned.

Throckmorton County

Sun Crest Oil Co.'s No. 1 W. L. Everett, gas sand 3,347-52 feet, initial production 1,500,000 feet of gas, total depth 3,352 feet.

Wichita County

George J. Proctor's No. 1 Spradling, dry and abandoned, total depth 1,095 feet. Schlaffke & Blair's No. 4 Honaker, oil sand 848-59 feet, initial production 40 bbls., total depth 859 feet. Walton & Blair's No. 6 Honaker, oil sand 852-61 feet, initial production 10 bbls., total depth 861 feet.

Young County

Belknap Coal Co.'s No. 4 Belknap, oil sand 659-68 feet, initial production 191 bbls.; drilled deeper, oil sand 693-700 feet, initial production 50 bbls., total depth 700 feet. Belknap Coal Co.'s No. 8 Belknap, oil sand 667-69½ feet, initial production 30 bbls., total depth 669½ feet. W. F. Brazelton and others' No. 1 Benson, dry and abandoned, total depth 963 feet. W. F. Brazelton and others' No. 7 Taack, dry and abandoned, total depth 747 feet. W. H. Junker's No. 1 J. A. Winkler, dry and abandoned, total depth 2,175 feet. King Royalty Co.'s No. 25 Larimore, oil sand 705-19 feet, initial production 64 bbls., total depth 720 feet. King Royalty Co.'s No. 27 Larimore, oil sand 707-19 feet, initial production estimated 24 bbls., total depth 719 feet.

Kleiner & Rigg's No. 2 Larimore, dry and abandoned, total depth 750 feet. George Mollenkoph's No. 1 T. J. Routon, dry and abandoned, total depth 760 feet. George Mollenkoph's No. 2 G. W. Terrell, dry and abandoned, total depth 772 feet. Sheldon & Shaw's No. 4 Belknap, oil sand 701-16 feet, initial production 50 bbls., total depth 745 feet. Swink & Smith's No. 1 Belknap Coal, oil sand 652-64 feet, initial production 170 bbls., total depth 664 feet. Swink & Smith's No. 2 Belknap, oil sand 652-67 feet, initial production 155 bbls., drilled deeper, oil sand 695-705 feet, initial production 90 bbls., total depth 705 feet. Swink & Smith's No. 3 Belknap, oil sand 647-58 feet and 687-96 feet, initial production 150 bbls., total depth 696 feet. Swink & Smith's No. 4 Belknap, oil sand 651-67 and 691-701 feet, initial production 150 bbls., total depth 701 feet. Wooten & Reed's No. 1 Robinson, dry and abandoned, total depth 703 feet. Wooten & Reed's No. 1 Josh Swain, dry and abandoned, total depth 694 feet. E. C. Stovall's No. 14 Fee, oil sand 4,271-72 feet, initial production 150 bbls., total depth 4,272 feet.

COMPLETIONS IN WEST TEXAS WEEK ENDING OCTOBER 17
Howard County

Cardinal Oil Co.'s No. 1 Settles, deepened, top big pay 2,397-2,401 feet, initial production 918 bbls. in 24 hours, total depth 2,401 feet.

Upton County

Crosby Oil Co.'s No. 1 Lane, top pay 2,285 feet, initial production 142 bbls. in 12 hours, total depth 2,336 feet.

Ward County

Sturm-Simms Oil Co.'s No. 1 Jones, top pay 2,473 feet, initial production 150 bbls., total depth 2,491 feet.

NEW ORDERS ISSUED ON PANHANDLE GAS

AUSTIN, Tex., Oct. 19.—The Railroad Commission in orders issued Monday adopted additional oil and gas conservation measures for Panhandle fields, effective October 20. These included: All oil strings or flow strings shall be tested for leakage by standing fluid columns 48 hours. Surface fittings shall be tested to 800 pounds. All wells shall be equipped with bradenhead or casinghead of 800-pound test. All wells encountering top of pay less than 3,300 feet shall be allowed a maximum sand penetration of 4 feet.

The commission has adopted gas conservation orders for the Panhandle, including: No operator shall take over three days in drilling in a gas well unless millerhead or other satisfactory equipment is used during process. Exceptions may be made by the commission. Casing in all wells must be set and cemented not more than 25 feet above formation, and if below lime, other casing must seal off lime gas.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 26)

Nelson et al's No. 1 Crewa, 330 ft. S and E, NW, Sec. 12, Blk. 26, H.&G.N. Sur. ..... S.D. 2,619 ft.
Nipper et al's No. 1 Morse, 330 ft. from N and E, Sec. 1, Blk. 26, I.&G.N. Sur. ..... Drlg. 725 ft.
Prairie Oil & Gas Co.'s No. 1 Morse, 330 ft. from N and E of Sec. 4, Blk. 36, H.&G.N. Sur. ..... Location.
Pulse-Shell Pet. Corp.'s No. 1 Wright, 330 ft. from S and W of Sec. 13, Blk. 3, I.&G.N. Sur. ..... Drlg. 565 ft.
Skelly Oil Co.'s No. 2 Heaston, 330 ft. from S and E N half NE, Sec. 164, Blk. 3, I.&G.N. Sur. ..... Moving in rotary.
Saunders et al's No. 2 Sullivan, 822 ft. from W and 231 ft. from NE, 160 ft. S, 264 ac. of N½, Sec. 136, Blk. 3, I.&G.N. Sur. ..... Will plug back to 3,275 ft. and shoot.
Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N½ NE, Sec. 15, Blk. A-9 H.&G.N. Sur. ..... Rig up and S.D.
Tarber's No. 1 Saunders, 330 ft. N and W, Sec. 3, Blk. 1, B.B.&S.F. Sur. ..... Location.
Quicksand Oil Co.'s No. 1 Chapman, 250 ft. from N and E, Sec. 69, Blk. 25, H.&G.N. Sur. ..... Rigging up.
Vulcan Corp.'s No. 1 Carpenter, 330 ft. from S and E, Sec. 25, Blk. 25, H.&G.N. Sur. ..... Fishing 12-in. bit 280 ft.

HUTCHINSON COUNTY

Danciger O. & R. Co.'s No. 1 Johnson, 330 ft. N and W, SE, Sec. 34, Blk. Y, A.&B. Sur. ..... Spudded and S.D.
Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E of N 80 ac., S 160 ac., Sec. 81, Blk. 46, H.&T.C. Sur. ..... S.D. 450 ft.
Huber Prod. Co.'s No. 1 Johnson Bros. (Premier), 330 ft. N and E of W 60 ac., N 80 ac., NW, Sec. 3, Blk. Y, A.&B. Sur. ..... S.D. 3,016 ft.
Smith & Daniels' No. 3 Pitcher, 990 ft. from S and 330 ft. from E, Sec. 19, Blk. M-21, T.C.R.R. Sur. ..... Drlg. 2,715 ft.
Skelly Oil Co.'s No. 1 Johnson Bros., 660 ft. S and W, SE, Sec. 30, Blk. Y, A.&B. Sur. ..... S.D. 3,115 ft.
Timms-Deatch's No. 4 Moore, 350 ft. N and W, Sec. 124, Blk. 4, I.&G.N. Sur. ..... Rig.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... T.D. 5,003 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch ..... Small S.O. 1,133-40 ft.; S.D. 4,167 ft.

MOORE COUNTY

Gulf Prod. Co.'s No. 1 Burnett, 330 ft. from N and W, Sec. 356, Blk. 44, H.&T.C. Sur. ..... Drlg. 1,210 ft.
Interstate's No. 1 Nield, C NE, Sec. 18, Blk. 44, H.&T. C. Sur. ..... Location.
Pollard et al's No. 1 Hall, 330 ft. S and E, NE, Sec. 131, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Sunray Oil Co.'s No. 2 Jones, 330 ft. N and W, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Texas Interstate P. L. Co.'s No. 1-23 Thompson, C N½ NE, Sec. 23, Blk. 44, H.&T.C. Sur. ..... Location.
Texas Interstate P. L. Co.'s No. 1-37 Sneed, C NW, Sec. 37, Blk. 6-T, T.&N.O. Sur. ..... Location.
Texas Interstate P. L. Co.'s No. 1 Coon, 2,025 ft. from N and 2,640 ft. from W, Sec. 149, Blk. 44, H.&T.C. Sur. ..... Drlg. 2,230 ft.
Texhoma Nat. Gas Co.'s No. 1 Coon-Sneed, center Sec. 8, Blk. 6-T, T.&N.O. Sur. ..... Drlg. 1,650 ft.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 530 ft.

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 12, T.&N.O. Sur. ..... S.D. 400 ft.
Chambers et al's No. 1 Herring, CNL, Sec. 20, Blk. S, G.C.&S.F. Sur. ..... Drlg. 2,792 ft.

PARMER COUNTY

Magnolia Pet. Co.'s No. 1 Wilson, 330 ft. from N and W of SE, Sec. 73, H. Kelly Sur. ..... Rigged up.

ROBERTS COUNTY

Chicken Creek Oil Co.'s No. 1 Ledrick, 330 ft. N and W, Sec. 55, Blk. C, G.&M. Sur. ..... S.D. 1,415 ft.; moving in rotary.
Travis et al's No. 1 Cunningham, 330 ft. S and W, Sec. 74, Blk. M-2, H.&G.N. Sur. ..... S.D. 2,690 ft.

WHEELER COUNTY

Clarity et al's No. 1 Porter, 330 ft. S and W, SE, Sec. 2, Blk. A-9, H.&G.N. Sur. ..... S.D. for 6-in. csg. at 2,150 ft.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 26)

FISHER COUNTY

The Texas Company's No. 1 Daniels, 357 ft. from S and 330 ft. from W lines of Sec. 194, Blk. 1, B.B&C. Sur. ..... First hole lost; drlg. 3,030 ft.
Cranfill & Reynolds' No. 1 George, 400 ft. from N and 330 ft. from E, Sec. 200, Blk. 1, B.B.&C. Sur. ..... Shut down 3,151 ft.; to deepen; top pay 3,087 ft.; 250 ft. oil in hole.

GAINES COUNTY

Texas Consolidated Oil Co. et al's No. 1 Jones, 2,312 ft. from NE Sec. 4, Blk. A-8, P.S.L. Sur. ..... Total depth 4,700 ft.

GARZA COUNTY

Pandem Oil Corp.'s No. 1 Justice, 330 ft. from S and W of Sec. 12, Blk. 4, H.&G.N. Sur. ..... Spudded and shut down.
Penny & Posey's No. 1 Justice, 1,980 ft. from S and 1,650 ft. from E of Sec. 25, Blk. 6, H.&G.N. Sur. (3,500-ft. cable tool test) ..... Total depth 3,202 ft.

HOWARD COUNTY

Green O. & R. Co.'s No. 1 Denman, 990 ft. from S and 2,310 ft. from W Sec. 14, Blk. 20, Twp. 1s, T.&P. Sur. .. Spudded and shut down.
Merrick & Lamb's No. 2 Chalk, 990 ft. from the N and W lines of Sec. 125, Blk. 29, W.&M.W.R.R. Sur. ..... Show oil 1,521 ft. and 1,620 ft.; drlg. 2,065 ft.

IRION COUNTY

Davis et al's No. 1 Suggs, 1,560 ft. from S and 925 ft. from W Sec. 3,081, Blk. 28, H.&T.C. Sur. ..... Shut down 4,002 ft.
Denny & Andrews' No. 1-A Tankersley, 200 ft. from S and 2,000 ft. from E of Sec. 709, J. P. Imhoff Sur. .. Shut down 463 ft.
Ellis Ryan Corp.'s No. 1 Nutt, 1,350 ft. from N and 450 ft. from E of Sec. 694, Kheikenholm Sur. ..... Shut down 1,815 ft.
Stanolind Oil & Gas Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. ..... Drlg. 6,640 ft.; small show of sweet gas at 6,600 ft.
Straughn & Adkins Bros.' No. 1 Lee, 1,080 ft. from W and 420 ft. from N of Sec. 729, C. Kaiser Sur. ..... Underreaming 10-in. casing 975 ft.

JONES COUNTY

Abers et al's No. 1 Burton, 150 ft. from S and 175 ft. from E of 43.4-acre tract in G. Martinez Sur. ..... Shut down 1,005 ft.

LOVING COUNTY

Ervin & Mahres' No. 1 Thrope, 2,310 ft. from E and 330 ft. from S Sec. 46, Blk. 53, T.&P. Sur. ..... Shut down 810 ft.
Slack's No. 1 Lynd, 990 ft. NE and 330 ft. SE of Sec. 3, Blk. 2, W.&N.W. Sur. ..... Drlg. 2,410 ft.
Falbre & Evans' No. 1 Dean, 330 ft. from NE and 990 ft. from NW Sec. 79, Blk. 33, H.&T.C. Sur. ..... Shut down 2,500 ft.
Lewis & Siagel's No. 1 Johnson, 330 ft. from N and 1,650 ft. from W Sec. 6, Blk. 56, Twp. 1, T.&P. Sur. .. Spudded and shut down.
Lockhart & Co.'s No. 3 Bowen & Wells, 330 ft. from NE and SE of Sec. 93, Blk. 1, W.&N.W. Sur. ..... Shut down 3,385 ft.
Tennant et al's No. 1 Martin, 990 ft. from NW and SW Sec. 66, Blk. 1, W.&N.W. Sur. ..... Shut down 1,400 ft.

MENARD COUNTY

Priest's No. 1 Sorrel, 1,000 ft. from E and 200 ft. from S cor. Sec. 132, E.L.R.R. Sur. ..... Shut down 2,860 ft.

PECOS COUNTY

Dittman's No. 1 Sanford, 330 ft. from NW and 1,650 ft. from NE of Sec. 55, Blk. 10, H.&G.N. Sur. ..... Total depth 1,300 ft.
Slaughter et al's No. 1 Sun Yates, 60 ft. S of Sun Oil Co.'s No. 1 Yates, Sec. 59, Blk. 1, I.&G.N. Sur. ..... Moving in material.

REAGAN COUNTY

Carl Cromwell et al's No. 1 University, 1,320 ft. from S line and 1,320 ft. from E line of Sec. 4, University Blk. 7 ..... Spudded 55 ft.
Big Lake Oil Co.'s No. 6-C University, 1,370 ft. from S and 1,000 ft. from E Sec. 12, Blk. 2 ..... Drlg. 1,305 ft.

REEVES COUNTY

Cunningham et al's No. 1 Wright, 1,320 ft. from S and W Sec. 58, Cassel's Sur. ..... Spudded and shut down.
F. McDorman et al's No. 1 Ray Roberts et al, 2,310 ft. from S and E lines of Sec. 22, Blk. 59, P.S.L. Sur. .. Material on ground.
James & Milton's No. 1 Patterson, 330 ft. from N and W of Sec. 21, Blk. 72 ..... Show oil and gas 2,855-65 ft.; show oil 3,120 ft.; drlg. 3,345 ft.
Lee O. White et al's No. 1 Hershersor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur. ... Shut down 5,044 ft.

RUNNELS COUNTY

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 519 ..... Shut down 2,700 ft.

SCHLEICHER COUNTY

Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... Shut down 4,500 ft.; contract depth.
Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... Drlg. 4,985 ft.
George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,570 ft. from W, G.H.&S.A. Sur. ..... Shut down 5,053 ft.

SCURRY COUNTY

G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor.of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Shut down 5,100 ft.
Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W Sec. 68, Blk. 3, H.&G.N. Sur. ..... Spudded and shut down.
Seifert & Dibble's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 153, Blk. 97, H.&T.C. Sur. ..... Shut down 3,500 ft.
Simon & Brock et al's No. 1 Cruse, 3,310 ft. from S and E Sec. 119, Blk. 97, H.&T.C. Sur. ..... Show oil 1,798, 1,820, 1,850 ft.; shut down 2,500 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M-K-T Sur. ..... Shut down 2,669 ft.
Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Georgetown Ry. Sur. ..... Shut down 3,150 ft.
Miller Bros.' No. 1 Allison & Burke, C NW cor. Sec. 10, Blk. 176, T.&P. Sur. ..... Shut down 120 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S Sec. 26, Blk. 161, G.C.&S.F. Sur. . Shut down 6,120 ft.
Jones et al's No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... Shut down 2,545 ft.
Sides et al's No. 1 Phelps, 2,157 ft. from N and 2,482 ft. from W Sec. 5, G. W. Turley Sur. ..... Location.

TOM GREEN COUNTY

Belding & Dutton's No. 1 Norsworthy, 1,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... Shut down 760 ft.; show oil and gas 725 ft.
Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur. ... Shut down 1,994 ft.
Pratt & Hancock's No. 2 Lewis, 100 ft. N and 330 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... Shut down 200 ft.

UPTON COUNTY

Rankin et al's No. 1 Cordova Union Land, 660 ft. from N and E Sec. 6, G.C.&S.F. Sur., 1¼ miles S of Rankin ..... Drlg. 3,965 ft.
Farley et al's No. 1 Lane, 2,310 ft. from S and 990 ft. from W Sec. 36, Blk. 1, M.-K-T. Sur. ..... Location.
T. P. Coal & Oil Co.'s No. 2 Shirk, 1,650 ft. from S and 330 ft. from E of Sec. 1, Blk. 3, M.-K.-T. Sur. ..... Location.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 10, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 5,360 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Shut down 6,780 ft.

WARD COUNTY

Boogher's No. 1 fee, 235 ft. from SE and 3,553 ft. from NE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Shut down 2,111 ft.
Bradford-Bentley's No. 1 Beatty, 330 ft. from SW and NW of Sec. 3, Blk. 34, H.&T.C. Sur. ..... Rigging up.
Buster Black's No. 1 Hall & Roberts, 990 ft. from NE and 1,650 ft. from NW Sec. 17, Blk. 32, H.&T.C. Sur. .. Drlg. 2,455 ft.; flowed 126 bbls. first 24 hours.
Central Oil & Gas Co.'s No. 1 Barrow, 330 ft. from NW and 1,263 ft. from SW Sec. 55, J. W. Jackson Sur. ..... Top pay 2,409 ft.; total depth 2,419 ft.; hole full oil.
H. V. Greer's No. 1 Carr, 150 ft. from NW and 510 ft. from SW Sec. 12, Blk. 5, H.&T.C. Sur. ..... Spudded and shut down.
Hankinson et al's No. 1 Emery, 3,090 ft. from SE and 510 ft. from SW Sec. 26, Blk. 5, H.&T.C. Sur. ..... Shut down 2,238 ft.
Moran & Miles' No. 1 Boogher, 3,603 ft. from NE and 1,303 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Shut down 715 ft.
R. F. Owen's No. 1 Lee, 1,344 ft. from NW and 4,583 ft. from SW Sec. 1, J. Howe Sur. ..... Drlg. 175 ft.
Peck & Fuglar's No. 1 Merritt, 3,063 ft. from NE and 1,698 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Top pay 2,155 ft.; 1,200 ft. oil in hole; total depth 2,234 ft.; to run tubing.
Prairie Oil & Gas Co.'s No. 1 Edmonson, 330 ft. from NW and 2,310 ft. from SW of Sec. 23, Blk. 5, H.& T.C. Sur. ..... Drlg. 905 ft.
Prairie Oil & Gas Co.'s No. 2 Edmonson, 330 ft. from NW and SW of Sec. 23, Blk. 5, H.&T.C. Sur. ..... Location.
Rector Oil Co.'s No. 1 Smith, 1,320 ft. from N and E, Sec. 22, Blk. A, G.M.M.B.&A. Sur. ..... Shut down 3,602 ft.
Rexford et al's No. 2 Johnson, 2,300 ft. from SE and 4,450 ft. from NE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Total depth 2,204 ft.; hole full oil.
Paul Ryan et al's No. 1 J. S. Reynolds, 4,110 ft. from NE line and 150 ft. from NW line, Sec. 12, Blk. 5, H.&T.C. Sur. ..... Shut down 2,040 ft.
Sudderth & Carey's No. 1 J. H. Boogher et al, 150 ft. from SW and SE lines of Lot 24, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Location.
Stanolind Oil & Gas Co.'s No. 1 Brown, 330 ft. from NW and SW Sec. 26, Blk. B-29 ..... Drlg. 1,742 ft.
Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... Shut down 4,545 ft.
White et al's No. 1 Burtner, 150 ft. from NE and 515 ft. from SE of Sec. 8, Blk. 32, H.&T.C. Sur. ..... Shut down 755 ft.

WINKLER COUNTY

Liner Drlg. Co.'s No. 1 Campbell, 350 ft. from N and E cor. Sec. 2, Blk. B-5 ..... Shut down 4,640 ft.

Braun

The factory in 1925 and below as it is today.

This modern and completely equipped plant; experienced field construction crews; long and successful experience—all under one management—these are the strength of the BRAUN organization.

From the beginning—research—through the designing, fabrication, and construction, to the operation of the finished unit, whether heat exchangers, cooling towers, or complete plants, BRAUN offers the ideal sought by all purchasers—undivided responsibility.

C. E. BRAUN & CO., INC.

ALHAMBRA, CALIFORNIA

NEW YORK • CHICAGO • TULSA • HOUSTON • LONDON

Brief Items for Petroleum Refiners

SUN OIL CO. EXTENDS NEW GASOLINE LINE

PITTSBURGH, Pa., Oct. 19.—The Sun Oil Co. has just completed the first delivery of gasoline to this city through the company's gasoline line originating at the Sun Oil Co. refinery in Marcus Hook, near Philadelphia. The gasoline will be held in storage here and will be barged into Wheeling, Cincinnati and Brownsville as well as other cities and towns along the Ohio, Allegheny and Monongahela Rivers.

At Vanport, on the Ohio, about 30 miles below Pittsburgh, is a reserve station carrying 160,000 bbls. of gasoline in storage tanks, and reserve pumps arranged to pump in either direction. At Vanport also the storage is arranged so that barges can be loaded rapidly from the tanks rather than directly from pipe lines.

This arrangement makes it possible to load fuel into a barge much faster than the capacity of the line would permit, and without interfering with the flow through the line. The storage at this point is sufficient to permit the loading of 150,000 bbls. into barges in a day.

Barges Being Built

The barges are of 5,000 bbls. capacity, drawing 8 feet of water when fully loaded. The first two are now in operation and more are being built. They will convey their cargoes to water-side distributing plants through the entire navigable length of the Allegheny and Monongahela and down the Ohio as far as the Mississippi, at which point it is estimated the limit is reached for economical employment of this mode of transportation. The tributaries of the Ohio, the Kanawha, Big Sandy and other navigable streams, will be supplied in the same way.

The fact that the rivers in this area are not often closed to navigation by ice insures year-around transportation by the cheapest method.

Water-side distribution plants are already in operation at McKeesport, Brownsville and Wheeling. They have from 10,000 to 20,000 bbls. capacity each. Another plant is under construction at Cincinnati, with capacity for four barge tows at a time.

BUILD SMALL REFINERY

GLASGOW, Ky., Oct. 19.—C. E. Curry of Owensboro, R. C. Snyder of Louisville, H. B. Wood of Lexington and J. A. Barrett of Glasgow have bought all the properties of the Cumberland Pipe Line Co. in the Wayne County district, which embraces Wayne, Pulaski and McCreary Counties, and plan to build a small refinery at Somerset on the Monticello road. Mr. Curry will be in charge of the refinery, on which work is to be started immediately. It will have a capacity of 1,000 bbls. daily. This will give a crude market for the central portion of the State, which has always been cared for by the Cumberland Pipe Line Co., one of the oldest oil lines in the State.

NEW PLANT IN MEXICO

According to newspaper reports from Mexico City, Mexico, the Standard Oil Co. of California through subsidiaries will shortly start the development of producing properties and also build a large refinery at Mexico City. The Standard of California has developed substantial outlets for refined products in the larger consuming centers of Mexico. The products are shipped from the California refineries of the Standard Oil Co. of California and the El Paso refinery of the Pasotex Petroleum Co., a subsidiary company.

REFINERS MAY SPEND MILLIONS TO IMPROVE GASOLINE OCTANE NUMBER

With very few exceptions every refinery organization operating plants east of California faces 1932 with the problem of raising the octane number of its gasoline. A comparatively small number of Middle West and East Coast refineries have installed cracking equipment in one form or another who are setting the pace. These companies happen to be of such importance that there seems to be no alternative for the others if they intend to hold the business on a quality basis.

Similarly, the industry in general has given prominence to the question by basing price quotations on the "octane number" of the gasoline. The sales organization of the respective refineries have jumped to discussing antiknock rating as the new index of quality.

Some 10 years ago the industry started seriously into the business of adding towers to its plants and then gasoline began to be judged by its distillation range. This prompted the spending of several hundred millions of dollars in re-replacement of shell stills by the more efficient pipe still units.

Almost simultaneously, refiners in general began investigating the merits of pressure cracking. Cracking stills were in operation in a few large plants but their operation was held as a "trade secret" as marketers were insisting on buying "straightrun" gasoline. It was not until research definitely established the fact that cracked gasoline was as good or better from a quality standpoint that cracking really came into its own and immediately hundreds of units of the pressure type were installed. The expenditures in these cracking units has been estimated in excess of $500,000,000 and the auxiliary equipment added will no doubt place the cost close to $1,000,000,000.

Next the industry became "volatility minded." Gasoline recovery plants and stabilizing units were added and refiners spent several more million dollars in the span of only a few years to meet the demands of this new mark of quality.

Now, with the acceptance of the "octane number" as the newest index of quality, refiners see before them what may prove to be the cause for junking much of the cracking equipment built five years ago or longer and major revisions in much of the newer cracking equipment. This program will be augmented by the installation of reforming units or vapor phase cracking units.

Recently the Standard Oil Co. of Ohio placed "X-70" on the market as its regular grade of motor gasoline. This gasoline is generally recognized as having a high antiknock value. More recently the Standard Oil Co. of Indiana announced that it will soon offer a new regular-grade gasoline and it is generally understood this will have a minimum octane number of 62. Along with the announcement that the Standard of Indiana will offer this new gasoline, plans were announced that the Standard Oil Co. of Kansas and the Midwest Refining Co. at Casper, Wyo., will add cracking equipment in order to make the higher octane gasolines. The Midwest company is a subsidiary of the Standard Oil Co. of Indiana.

The new unit at the Casper plant will have a charging capacity of 6,500 bbls. daily and will replace the present high pressure Burton stills. Similarly, the Standard of Kansas will start immediately the construction of a cracking or reforming unit which will handle 5,000 bbls. of charging stock daily. The Casper job has been let to the M. W. Kellogg Co.

In addition to the reforming unit, it will be necessary in most cases for the refiners to also add to their stabilizing units and gas recovery plants. In some instances modifications will have to be made in the treating equipment. A rough estimate of the expense involved in adding a 5,000-bbl. reforming unit is made at $300,000 in each case.

At this point, the question of introducing a second grade of Ethyl Gasoline must be considered. Recent advice from those companies interested in adding a second grade of Ethyl is to the effect that the Ethyl Gasoline Co. does not favor such a move in this country at the present time. It is not definitely stated, however, that a second grade will not be permitted at some early future date. If a second grade is permitted, impetus will be given the trend toward the adoption of high standards for the antiknock rating of gasolines. The question of costs will then resolve itself into playing the expense of carrying the investment and the operation of the reforming unit against the royalty and cost of using Ethyl fluid.

Whereas a straightrun gasoline of 400 endpoint may be made from East Texas crude having an octane number of 55, it may soon be necessary to market a 65 octane number gasoline to meet competition. This may be done easily by those refiners running East Texas crude and operating cracking units from which a gasoline of 65 to 70 octane number may be made. Under the present arrangement this is about the position of most of the refiners along the Gulf Coast.

In those plants where an average Mid-Continent crude is run the octane number of the straightrun gasoline of 410 to 415 endpoint will approximate 50. Where that plant is balanced for pressure cracking the cracked gasoline will generally have an octane number of 66 to 68. By blending the two, the refinery is able to meet a 60 octane specification in practically all cases. Now, however, if the minimum octane number for the regular grade is to be raised to 65 or 70 as has been suggested by the placing of such gasolines on the market by major refiners, the average refiner will be obliged to add reforming units or their equivalent, vapor phase cracking units, from which he will be able to recover a gasoline having an octane number of 75 to 78. This latter gasoline blended with the regular refinery production will enable him to meet the 70 octane number specification.

This cannot be done by simply adding the reformed gasoline, however. It necessitates a new procedure in operating the topping unit. It usually means that the refiner must make a 350 to 360 endpoint straightrun gasoline off the topping unit and this will have an octane number of 60 to 63 even from average Mid-Continent crude. As a result of this revised procedure a long cut between the light gasoline and distillate is secured as charging stock for the reforming unit. Thus there will be no gasoline made in the plant which will not be 60 octane number or better.

To bring about such a change in the operation the refiner will need to rebalance his plant. It will mean that the gasoline recovery system will have to be doubled, vacuum rerunning stills and towers will be needed in most cases and increased capacity will have to be provided in the treating system.

NAVY AWARDS CONTRACT FOR AVIATION GASOLINE

NEW YORK, Oct. 20.—The Navy Department has just awarded contracts for 858,000 gallons of Stanavo aviation gasoline of which 723,000 gallons will be delivered by Standard of New Jersey, 95,000 by Standard Oil Co. of Pennsylvania, and 40,000 gallons by Colonial Beacon Oil Co.

Deliveries will be made to naval stations at Anacostia, Annapolis, Boston, Squantum, Hampton Roads, Philadelphia, Brooklyn, and to the Navy proving grounds at Dahlgren, Va.

Part of the supply scheduled for Hampton Roads and New York Harbor will be delivered in bulk by barges to Navy vessels at government docks or within harbor limits, this method being followed in fueling the Navy's aircraft carriers Lexington and Saratoga and other Navy vessels maintaining flying equipment.

MARATHON GETS EAST TEXAS OIL

FORT WORTH, Tex., Oct. 20.—Marathon Oil Co.'s refinery in Fort Worth is now receiving East Texas crude through the Texas Pipe Line Co.'s line.

Illinois Pipe Line Co. has discontinued shipments of crude oil from East Texas by tank cars and is now delivering production from Mid-Kansas Oil & Gas Co., another subsidiary of Ohio Oil Co., to the Texas Pipe Line Co.'s Longacre station in the Joiner Pool of Rusk County for delivery to Fort Worth. Marathon is a refining and marketing subsidiary of Ohio Oil Co.

ADD TO BOONE REFINERY

The Boone Refining Co., which has a small plant 1 mile east of Arp in Rusk County, has just completed erecting a tube still at the plant and will process more crude oil from the Joiner area. A small line connects the plant with production in this pool. The plant has been rated as a 500-bbl. per day capacity plant.

BUILD NEW PLANT

LOS ANGELES, Calif., Oct. 20.—Fields Chemical Corp. has started work on building a plant in Long Beach which is to treat residue oils by a patented process invented by John Fields. It is claimed the process enables 100 per cent of the raw crude to be utilized. The plant is scheduled to be in operation by January 1, 1932.

SMALL OHIO PLANT STARTS

FORT CLINTON, Ohio, Oct. 17.—Manufacture of gasoline has been started at the refinery of the Peninsula Oil Co., of Catawba Island, near here, where the company has 11 wells. The company also has holdings near Bowling Green, in Wood County, Ohio.

Officials of the company said the refinery will have an initial production of 25 bbls. of gasoline a day.

START SOVIET UNIT

NEW YORK, Oct. 17.—The Soviet oil authorities have placed the first section of the Winkler-Koch cracking installation at Baku in operation. The installation has a daily capacity of 500 tons of mazout or 160 tons of gasoline, and is operated entirely by Soviet specialists.

Manufacture of Natural Gasoline

City of 10,000 Now Being Served With Butane-Propane Gas

Las Vegas, N. M., is now being supplied with natural gas as the result of the recent completion of the first butane-propane plant in the State. The city has a population of approximately 10,000 and is the largest city to receive its gas supply from this source.

The liquid gas is transported from the California fields to Las Vegas in tank cars and a pipe line 13 miles in length supplies the customers in the city.

The Nevada Gas Co., securing the franchise, is incorporated in this State and will have its principal office in Las Vegas, but it is a subsidiary of the Lang Transportation Co. of Los Angeles, engaged in trucking all over California and in the operation of passenger stages at Long Beach. H. W. Wickstrom, formerly with the Associated Oil Co., is the engineer of the Lang gas interests.

The Nevada Gas Co. will probably enter other cities in the State, if its success justifies further investment.

The company serves a straight mixture of butane-propane gas with no admixture of air. Its heat content is 3,000 B.t.u. per 1,000 feet, although service is based upon the 550 B.t.u. content of the manufactured gas served in the city before the former company went into bankruptcy about 10 years ago. The rate established makes the cost to the customer considerably lower.

The maximum rate has been set at $2 for 550 B.t.u. and the minimum at $1. At Reno, $2.50 is the maximum charge for the manufactured product.

USE COMPRESSED GAS FOR LIGHTING CARS

LOS ANGELES, Calif., Oct. 20.—Compressed natural gas will replace Pintch gas in about 300 Southern Pacific Railroad baggage and mail cars for illuminating these cars. All that will be necessary in making the change is to replace the present burners.

It is not intended that natural gas be generally adopted in the newer cars where electric lighting has been provided. The move to use natural gas was prompted as an economy measure because of the small amount of investment needed to make the conversion to gas whereas a much larger expense would have occurred if the cars were to be equipped for electricity.

The compressed gas is kept in tanks under the cars and will be supplied from Los Angeles.

FRANCE TO TAKE MORE NATURAL

LOS ANGELES, Calif., Oct. 19.—Natural gasoline manufacturers are expecting the new French refineries to increase their purchases of natural gasoline in the near future as construction work on these plants is completed. France has instituted a law practically eliminating gasoline and other refinery products from the competition offered by products manufactured in the local plants. France has been the largest buyer of natural gasoline and high gravity refinery gasoline to be shipped from the Pacific Coast.

BUREAU OF MINES REPORT

The procedure and the apparatus for the determination of hydrogen sulphide, explained on this page October 15, was developed by the Bureau of Mines and has been published by John M. Devine and C. J. Wilhelm of the bureau as a "Report of Investigations 3128."

FIGHTING GRADE SPECIFICATIONS PERMIT 6.5 REID VAPOR PRESSURE

A Reid vapor pressure of 6½ pounds has been set as the tentative maximum specification for the fighting grade of aviation gasoline according to a proposal submitted by the U. S. Bureau of Mines to cover purchases made by the army and supersedes No. Y-3,557-C of May 13, 1931. The new specifications also provide for a minimum knock rating in which the gasoline is required to have an octane number of 87 or more. The specifications further permits the addition of tetraethyl lead fluid.

In order to meet the very low vapor pressure, natural gasoline manufacturers intending to supply this material will necessarily have to resort to the most careful fractionation and stabilization of the product.

The summary of specifications tentatively submitted to the industry includes the following:

1. Antiknock Value—The antiknock value shall not be less than 87 octane number.

2. Tetraethyl lead may be added in the form of Ethyl fluid in concentration not exceeding 6 ml. of tetraethyl lead per U. S. gallon.

3. Benzol and similar aromatic hydrocarbons may be added in such quantity that the blend meets all requirements for the finished fuel and the freezing point specified, in particular.

4. The color shall be blue and the shade shall agree with sample supplied by the procuring agency. The intensity shall be equal to or greater than that of the sample.

5. Corrosion, Method 530.1—One hundred ml. of the gasoline evaporated in a polished copper dish shall cause no gray nor black corrosion.

6. Gum—The gasoline shall also be subject to an accelerated aging test at 100° C. (212° F.) with oxygen at approximately 100 pounds pressure for four hours, on evaporation of 100 ml. of a mixture of oxidized sample and gum solvent, the amount of residue shall not exceed 10 mg.

7. Sulphur, Method 520.11—Sulphur shall not be over 0.10 per cent.

8. Distillation Range—The limits are as follows:

When the thermometer reads 75° C. (167° F.) not less than 10 per cent shall be evaporated.

When the thermometer reads 100° C. (212° F.) not less than 50 per cent shall be evaporated.

When the thermometer reads 135° C. (275° F.) not less than 90 per cent shall be evaporated.

The residue shall not exceed 2 per cent.

The per cent evaporated shall be found by adding the distillation loss to the amount collected in the receiver at each specification point.

9. Reid Vapor Pressure—The Reid vapor pressure at 37.8° C. (100° F.) shall not exceed 6.5 pounds per square inch. The pressure shall be determined as specified in A.S.T.M. tentative method of test for vapor pressure of natural gasoline (Reid method) A.S.T.M. designation D-323-30 T issued 1930.

10. Freezing Point—The freezing point as indicated by the initial formation of solid rather than by the cloud point shall not be higher than minus 60° C. (minus 76° F.).

Method of Inspection and Tests

The gasoline shall be subject to inspection by the Procuring Agency at such place or places as specified in the contract or purchase order. When inspection is conducted at place of manufacture, the inspector shall be furnished all necessary facilities to determine compliance with this specification.

Acceptance or approval in course of manufacture shall in no case be construed as a guarantee of the acceptance of the finished product.

Sample—A sample of not less than 1 gallon shall be forwarded to the place of inspection for tests. The shipment will not be acceptable until this has been inspected and tested.

All tests not described herein shall be made in accordance with the latest issue of the Bureau of Mines Technical Paper No. 323, "Methods for Testing Lubricants and Liquid Fuels."

Method of Determining Antiknock Value—The antiknock value of the sample shall be determined by comparison with either the required mixture of octane and heptane or against a secondary standard which has been calibrated against the required octane-heptane mixture. The calibration of the secondary standard and the tests on the sample shall be carried out in an Ethyl Gasoline Corp. Series 30 knock test engine.

Accelerated Aging Test with Oxygen for Gum

a. An eight-ounce sample bottle containing 200 ml. of the finished fuel to

(Continued on Page 101)

TIDAL BUILDS BOOSTER STATION IN EAST TEXAS

The Tidal Refining Co. is constructing a booster station on the Gulf Production Co.'s Fishburn lease in the F. W. Johnson Survey, Gregg County, and is laying a 6-inch gathering line from the company's Lake Davernie lease in the William Painter Survey to this station. It will also connect to the Texas Pacific Coal & Oil Co.'s property in the C. Hampton Survey, to the northwest, and will run this company's production. Heretofore, the T. P. Coal & Oil company has been shipping the oil by tank car from loading rack on the railroad to the south, where it constructed a loading rack soon after its first well was completed. The oil has been going to the company's refinery at Fort Worth.

PRODUCE NEARLY PURE CARBON DIOXIDE GAS

SEATTLE, Wash., Oct. 20.—Gas-Ice Corp. of Washington, recently formed by officials of the Northwestern Natural Gas Corp. and a few others, to develop the carbon dioxide deposits at Klickitat Springs, Wash., has announced that it has contracted for the sale of the entire output of its first dry ice unit for a period of 10 years. The amount is 7,000 pounds daily. The unit will be capable of enlargment to double this amount by a few minor changes. The plant is to be in operation by February 1. The name of the purchaser has not been given.

The Klickitat Springs carbon dioxide gas is said to be one of the few deposits on the continent that is free from hydrogen sulphide, an impurity affecting similar gases elsewhere. Analysis by the University of Kansas shows:

Carbon dioxide	99.6
Oxygen	.03
Nitrogen	.37
Hydrogen sulphide	none

LARGE KETTLEMAN HILLS PLANT

The natural gasoline plant which will be built by The Texas Company in the Kettleman Hills area of California to replace the company's plant destroyed by fire a month ago, will have a capacity of 80,000 gallons daily.

STANDARD GASOLINE CO. GIVEN HIGHEST AWARD

The Standard Oil Co. of California received the highest award among the natural gasoline companies competing in establishing records for the lowest frequency in lost time accidents. The 1931 awards were made in the past week at the close of the meeting of the petroleum section of the National Safety Council in Chicago October 15. In Group B the Midwest Refining Co. received the highest award. C. L. Hightower of the Texas Pacific Coal & Oil Co. and well known among natural gasoline plant operators in the Mid-Continent, was named vice chairman to succeed D. J. Wallace of the Mid-Continent Petroleum Safety Council.

The list of companies receiving medals and certificates of merit include:

Group A

1. Standard Oil Co. of California. Standard Gasoline Co., California. (907,296 man-hours worked—4 lost time accidents—frequency rate 4.409.)

2. Sinclair Oil & Gas Co., Tulsa, Okla. (752,414 hours worked, 8 lost time accidents with a frequency rate of 10.632.)

3. The Empire Companies, Bartlesville, Okla. (424,197 hours worked, 6 lost time accidents with a frequency rate of 14.144.)

Group B

1. Midwest Refining Co., Casper, Wyo. (248,056 man-hours worked—no lost time accidents.)

2. Lone Star Gas Co., Dallas, Tex. (126,831 hours worked with no lost time accidents.)

3. Mid-Continent Petroleum Corp., Tulsa, Okla. (110,591 hours worked with no lost time accidents.)

4. The Ohio Oil Co., Rocky Mountain Division, Findlay, Ohio. (71,250 hours worked with no lost time accidents.)

5. Shell Petroleum Corp., Wolverine Petroleum Corp., Tulsa, Okla. (55,929 hours worked with no lost time accidents.)

6. The Ohio Oil Co., Louisiana Division, Findlay, Ohio. (33,885 hours worked with no lost time accidents.)

7. Shell Petroleum Corp., Comar Gasoline Co., Tulsa, Okla. (27,861 hours worked with no lost time accidents.)

8. Louisiana Oil Refining Corp., Cotton Valley Absorption Plant, Cotton Valley, La. (26,932 hours worked with no lost time accidents.)

9. Shell Petroleum Corp., Comar Oil Co., St. Louis, Mo. (25,409 hours worked with no lost time accidents.)

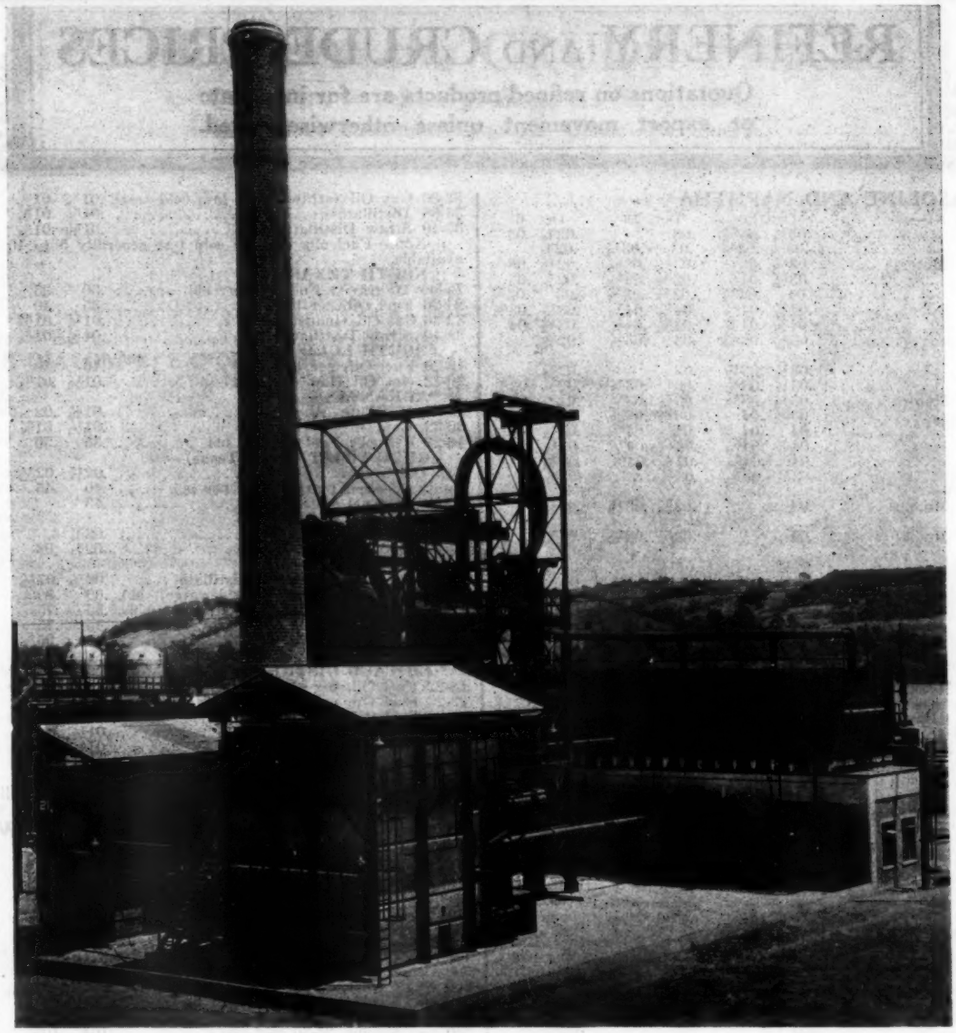
10. The Ohio Oil Co., Oklahoma Division, Findlay, Ohio. (24,030 hours worked with no lost time accidents.)

BUILD GASOLINE PLANT

A plant for the extraction of gasoline from casinghead gas is being erected on the Adams farm, Greendale Township, Midland County, by the Bell Gasoline Co., which operates a similar plant in the old Muskegon Field. According to unofficial reports the Pure Oil Co. is planning a similar venture to handle the casinghead gas of its wells.

The Bell company already has put in a foundation for its plant and is moving in machinery. It will be several days before the plant will be ready for operation.

Oil wells in the East Pool, in Greendale Township, Midland County, consistently have produced a heavy head of gas along with the oil production, and it will be this gas which will be processed for the extraction of gasoline. Most of the casinghead gas has been allowed to escape in the air having little commercial value without processing. In some instances the gas has been used to power drilling engines.



Low Temperature Rerun Units

The fractionation of pressure distillate at low temperature and after short exposure to heat is effected in this two-stage rerun unit.

The equipment provides products of improved color, stability and gum content in addition to a marked increase in yield over other methods.

FOSTER WHEELER CORPORATION
165 Broadway, New York, N. Y.
Branches in Principal Oil Centers

Foreign Associates: Foster Wheeler Limited; London, England.
Foster Wheeler Limited; Toronto-Montreal, Canada.
Societe Anonyme Foster Wheeler; Paris, France.

FOSTER WHEELER

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

OKLAHOMA (Group 3)—	Oct. 20		Oct. 13		Oct. 6	
50-52 450 endpoint	.03¼	.03½	.03		.02¾	.03
56-58 450 endpoint	.03⅜	.03½	.03	.03¼	.02¾	
58-60 437 endpoint (U. S. Motor)	.03⅝	.04	.03⅜	.03⅝	.02⅞	.03
60-62 437 endpoint	.03⅝	.04	.03⅜	.03⅝	.02⅞	.03
60-62 400 endpoint	.04	.04¼	.03⅝	.03¾	.03	.03⅜
64-66 375 endpoint	.04½	.04⅝	.04½	.04½	.03¼	.03¾
68-70 360 endpoint	.04⅝	.04¾	.04⅝	.04⅝	.03½	.04
64-66 437 endpoint (blend)	.03½	.03⅝	.03	.03¼	.02¾	
NORTH TEXAS—						
50-52 450 endpoint	.03¼	.03½	.03		.02¾	
58-60 450 endpoint	.03¼	.03½	.03	.03¼	.02⅝	.02¾
58-60 437 endpoint (U. S. Motor)	.03½	.03⅝	.03¼	.03½	.02⅝	.03
60-62 400 endpoint	.03¾	.04	.03½	.03⅝	.03	.03⅝
64-66 390 endpoint	.04	.04⅛	.04	.04⅛	.03⅛	.03½
64-66 375 endpoint	.04⅜	.04⅝	.04¼	.04½	.03¼	.03¾
68-70 360 endpoint	.04⅝	.04⅞	.04⅝	.04⅝	.03½	.04
64-66 437 endpoint (blend)	.03¼	.03½	.03¼		.02¾	
*NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.04		.03⅜	.03½	.03¼	
*ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.04		.03⅜	.03½	.03¼	
PENNSYLVANIA—						
52-54 Naphtha	.04¼		.04½		.04⅞	
54-56 Naphtha	.04¼	.04½	.04½	.04¾	.04⅞	.05
58-60 Gasoline	.04½	.04¾	.04¾		.05	
60 Gasoline	.04¾	.05	.04¾	.05	.05	.05¼
62 Gasoline	.05	.05¼	.05		.05½	
64 Gasoline	.05¼	.05⅝	.05¼	.05½	.05⅝	
68-70 350 endpoint gasoline	.06		.06		.06¼	
CALIFORNIA—						
†54-58 437 endpoint (U. S. Motor) domestic	.05¾	.06¾	.05¾	.06¾	.06	.07
58-60 400 endpoint domestic gasoline	.06¼	.07¼	.06¼	.07¼	.06¼	.07¼
CHICAGO DISTRICT (Based on Group 3)—						
50-62 450 endpoint (Naphtha)	.03⅛	.03¼	.03	.03⅛	.02¼	.02½
58-60 437 endpoint (U. S. Motor)	.03⅜	.03⅝	.02¾	.03	.02½	.02¾
60-62 400 endpoint	.03½	.04	.03¼	.03½	.02¾	.03⅛
64-66 375 endpoint	.04⅛	.04½	.04	.04¼	.03½	.04
68-70, 360 endpoint	.04½	.04¾	.04⅛	.04¼	.03⅛	.04⅛
64-66 437 endpoint (blend)	.03½	.03¾	.02¾	.03	.02⅝	.02¾
GULF COAST (Export)—						
58-60 U. S. Motor	.03½	.04	.03½	.04	.04	.04½
60-62 400 endpoint	.04¼		.04¼		.04¼	.04½
61-63 390 endpoint	.04¼		.04¼		.04½	.04¾
64-66 375 endpoint	.04½		.04½		.04½	.04¾

*Louisiana, Arkansas and Mississippi delivery. †For Pacific Coast consumption.

NATURAL GASOLINE

OKLAHOMA (Group 3)—	Oct. 20		Oct. 13		Oct. 6	
Grade A, 72-79.9, 375 e.p., rec. 90%	.04⅜		.04¼		.04¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04¼		.04¼		.04	.04¼
Grade B, 76-83.9, 375 e.p., rec. 85%	.04¼		.04¼		.04	.04¼
Grade BB, 84-92, e.p., rec. 85%	.04¼		.04¼		.04	.04¼
Grade C, 80-92, 375 e.p., rec. 78%	.04¼		.04¼		.04¼	
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.04¼		.04		.04	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04		.04		.03¾	.04
Grade B, 76-83.9, 375 e.p., rec. 85%	.04		.04		.03¾	.04
Grade BB, 84-92, 375 e.p., rec. 85%	.04		.04		.03¾	.04
Grade C, 80-92, 375 e.p., rec. 78%	.04		.04		.03¾	.04
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.04¼		.04⅛		.04	
Grade BB, 84-92, 375 e.p., rec. 85%	.04¼		.04⅛		.04	
Grade C, 80-92, 375 e.p., rec. 78%	.04¼		.04⅛		.04	
CALIFORNIA—						
75-78 375-390 endpoint	.04¾	.05½	.04½	.05½	.04½	.05½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.04¼		.04¼		.04	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04¼		.04¼		.04	
Grade BB, 84-92, 375 e.p., rec. 85%	.04¼		.04¼		.04	

BURNING OIL

OKLAHOMA (Group 3)—	Oct. 20		Oct. 13		Oct. 6	
41-43 water white kerosene	.02	.02⅛	.01⅞	.02	.01⅞	.02
42-44 water white kerosene	.02⅛	.02¼	.02⅛	.02¼	.02⅛	.02¼
NORTH TEXAS—						
41-43 water white kerosene	.02	.02⅛	.01⅞	.02	.01⅞	.02
40-41 water white kerosene	.02		.01⅞		.01¾	.01⅞
*NORTH LOUISIANA—						
41-43 water white	.02½		.02¼	.02½	.02¼	
*ARKANSAS—						
41-43 water white kerosene	.02½		.02¼	.02½	.02¼	
PENNSYLVANIA—						
43 Kerosene prime white	.03½		.03⅜		.03⅜	
45 Kerosene water white	.03⅝	.03¾	.03½		.03½	
46 Kerosene water white	.03⅞	.04	.03⅞		.03⅞	
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.04	.05	.04	.05	.04	.05
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white kerosene	.02	.02⅛	.02	.02⅛	.01⅞	.02⅛
42-44 water white kerosene	.02⅛	.02⅜	.02⅛	.02⅜	.02	.02¼
GULF COAST (Export)—						
41-43 prime white	.03½		.03½		.03½	
44 prime white	.03½	.03¾	.03½	.03¾	.03½	.03¾

*Louisiana, Arkansas, Mississippi and East Texas delivery.

FUEL OIL

OKLAHOMA (Group 3)—	Oct. 20		Oct. 13		Oct. 6	
Below 18 gravity Fuel Oil, per bbl.	.25	.30	.25	.30	.25	.30
18-22 Fuel Oil, per bbl.	.27½	.35	.27½	.35	.27½	.35
20-22 Fuel Oil, per bbl.	.30	.35	.27½	.35	.27½	.35
22-26 Fuel Oil, per bbl.	.32½	.37½	.30	.37½	.30	.37½
24-26 Fuel Oil, per bbl.	.37½	.42½	.35	.40	.35	.40
26-30 Fuel Oil, per bbl.	.45	.50	.42½	.47½	.42½	.47½
28-30 Fuel Oil, per bbl.	.47½	.52½	.45	.50	.42½	.47½
32-36 Gas Oil (industrial)	.01⅞	.01½	.01¼	.01½	.01⅞	.01¼
32-36 Gas Oil (straw color, high cold test)	.01⅞	.01½	.01¼	.01½	.01⅞	.01¼
32-36 Gas Oil (straw color, low cold test)	.01⅝	.01¾	.01⅜	.01½	.01¼	.01⅜
36-38 Distillate	.01⅝	.01¾	.01½	.01⅝	.01⅜	.01½
24-26 Fuel Oil, per bbl.	.35	.40	.30	.35	.30	.35
38-40 Straw Distillate	.01⅜	.01¾	.01½	.01⅞	.01⅜	.01⅞

Note—Fuel oils over 40 cold test generally 5 to 10 cents per barrel less when available.

NORTH TEXAS—						
Below 20 gravity Fuel Oil, per bbl.	.30	.35	.25	.30	.25	.30
24-26 Fuel Oil, per bbl.	.35	.40	.30	.35	.30	.35
32-36 Gas Oil (industrial)	.01¼	.01⅜	.01⅛	.01¼	.01	.01¼
38-40 Straw Distillate	.01⅜	.01¾	.01½	.01⅝	.01⅜	.01½
*NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.40	.50	.40	.50	.40	.50
30-32 Gas Oil (low cold test)	.01½	.01¾	.01½	.01¾	.01½	.01¾
*ARKANSAS—						
33-36 Distillate	.01¾	.02	.01¾	.02	.01¾	.02
30-32 Gas Oil	.01½	.01¾	.01½	.01¾	.01½	.01¾
16-22 Refinery Fuel Oil, per bbl.	.35	.50	.35	.50	.35	.50
GULF COAST (South Texas)—						
Gas Oil	.02¼	.02½	.02¼	.02½	.02¼	.02½
Bunker C Fuel (cargo lots), per bbl.	.40	.45	.40	.45	.40	.45
Bunker C Fuel (small lots)	.45		.55		.55	
PENNSYLVANIA—						
30-34 Fuel Oil	.02¾		.02¾	.03	.02¾	.03
36-40 Gas Oil	.02¾	.03	.03		.03	
CALIFORNIA—						
42-45 480 endpoint engine distillate	.06½	.07½	.06½	.07½	.06½	.07½
15-19 Fuel Oil, Bunker (at tidewater), bbl.	.60	.80	.60	.80	.60	.80
15-19 Fuel Oil, cargo lots (tidewater), bbls.	.55	.75	.55	.75	.55	.75
†15-19 Fuel Oil (f.o.b. tank cars), bbl.	.45	.75	.45	.75	.45	.75
27 plus Diesel, per bbl.	.80	.95	.80	.95	.80	.95
30-34 Gas Oil	.80	.95	.80	.95	.80	.95
CHICAGO DISTRICT (Based on Group 3)—						
18-22 Fuel Oil, per bbl.	.30	.35	.30	.35	.27½	.30
22-26 Fuel Oil, per bbl.	.32½	.40	.32½	.40	.27½	.35
28-30 Fuel Oil, per bbl. (zero)	.47½	.52½	.47½	.52½	.45	.50
32-36 Gas Oil (industrial)	.01½	.01⅝	.01½		.01½	.01¼
32-36 Gas Oil (zero)	.01⅝	.01⅞	.01⅝		.01¼	.01⅝
38-40 Straw Distillate	.01¾	.02	.01¾		.01¾	.01⅞

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Lowest priced fuel oil has high sulphur content.

LUBRICATING OIL AND WAX

OKLAHOMA (Group 3)—	Oct. 20		Oct. 13		Oct. 6	
100 vis., 2 color, 20-25 cold test	.04½	.04¾	.04½	.04¾	.04½	.04¾
100 vis., 3 color, 20-25 cold test	.04	.04½	.04	.04½	.04	.04½
150 vis., 3 color, 20-25 cold test	.06¾	.07¼	.06¾	.07¼	.06¾	.07½
150 vis., 4 color, 20-25 cold test	.06¼	.06½	.06¼	.06½	.06¼	.06½
180 vis., 3 color, 23-28 cold test	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
180 vis., 4 color, 23-28 cold test	.07¾	.08¼	.07¾	.08¼	.07¾	.08¼
180 vis., 5 color, 23-28 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
200 vis., 3 color, 23-28 cold test	.09½	.10	.09½	.10	.09½	.10
200 vis., 4 color, 23-28 cold test	.09	.09¼	.09	.09½	.09	.09¼
200 vis., 5 color, 23-28 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
240 vis., 3 color, 25-30 cold test	.11	.11¼	.11	.11¼	.11	.11¼
240 vis., 4 color, 25-30 cold test	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
240 vis., 5 color, 25-30 cold test	.09¾	.10	.09¾	.10	.09¾	.10
280 vis., 3 color, 25-30 cold test	.12½	.13	.12½	.13	.12½	.13
280 vis., 4 color, 25-30 cold test	.11½	.12	.11½	.12	.11½	.12
280 vis., 5 color, 25-30 cold test	.10¾	.11	.10¾	.11	.10¾	.11
Cylinder Stocks:						
600, steam refined, light green	.04½	.06	.04½	.06	.04½	.06
600, steam refined, dark green	.04	.05	.04	.05	.04	.05
190-210 vis., D color, Bright Stocks	.21	.22	.21	.22	.21	.22
150-160 vis., D color, Bright Stocks 0-10 c.t.	.19½	.20	.19½	.20	.19½	.20
150-160 vis., D color, Bright Stocks 10-25 c.t.	.19½		.19½		.19½	
150-160 vis., D color, Bright Stocks 25-40 c.t.	.19		.19		.19	
150-160 vis., E color, Bright Stocks	.18½	.19	.18½	.19	.18½	.19
Waxes:						
124-126 White Crude Scale Wax	.01⅝	.01⅞	.01⅝	.01⅞	.01⅝	.01⅞

All bright stock prices are for domestic movement.

PENNSYLVANIA—						
34 Neutral	.05½	.06½	.05½		.05½	
34 Sundebloom	.05	.05½	.05	.05½	.05	.05½
36 Miners' Neutral	.05½		.05½		.05½	
150, 3 color	.17	.17½	.17	.17½	.17	.17½
180, 3 color	.19	.19½	.18½	.19	.18½	.19
200, 3 color	.21½		.21	.21½	.21	.21½
220, 3 color	.24	.26½	.22	.26½	.22	.26½
600, steam refined	.14¼	.15	.14	.14½	.14	.14½
650, steam refined	.18	.18½	.17½	.18	.17½	.18
600, Pennsylvania Flash	.19	.20½	.18½	.19	.18½	.19
600, E filtered	.18	.19	.18		.18	
600, D filtered, Oil City	.23	.23½	.22½	.23½	.22½	.23½
Pennsylvania Bright Stocks below 35 c.t.	.28		.27	.27½	.28	
Pennsylvania Bright Stocks above 35 c. t.	.26½	.27	.27		.27½	
*122-124 White Crude Scale Wax	.02		.02		.02	
*124-126 White Crude Scale Wax	.02		.02		.02	

*At New York.

GULF COAST (South Texas)—						
100 vis., 2-2½ color, pale oil	.05½	.05¾	.05½	.05¾	.05½	.05¾
200 vis., 3 color, pale oil	.07½	.07⅝	.07½	.07⅝	.07½	.07⅝
300 vis., 3 color, pale oil	.08¾	.08⅞	.08¾	.08⅞	.08¾	.08⅞
500 vis., 3½ color, pale oil	.09⅞	.10⅜	.09⅞	.10⅜	.09⅞	.10⅜
750 vis., 3½ color, pale oil	.11⅜	.11⅞	.11⅜	.11⅞	.11⅜	.11⅞
1,200 vis., 3½ color, pale oil	.13⅞	.14⅜	.13⅞	.14⅜	.13⅞	.14⅜
2,000 vis., 4 color, pale oil	.14⅞	.15⅜	.14⅞	.15⅜	.14⅞	.15⅜
200 vis., 5-6 color, red oil	.06¾	.06⅞	.06¾	.06⅞	.06¾	.06⅞
300 vis., 5-6 color, red oil	.07⅞	.08⅜	.07⅞	.08⅜	.08⅛	.08⅜
500 vis., 5-6 color, red oil	.09½	.09⅝	.09½	.09⅝	.09½	.09⅝
1,200 vis., 5-6 color, red oil	.12⅞	.13⅜	.12⅞	.13⅜	.12⅞	.13⅜
2,000 vis., 6 plus color	.14⅞	.15⅜	.14⅞	.15⅜	.14⅞	.15⅜
CALIFORNIA—						
130 vis., 2½-3 color	.08¼	.08¾	.08¼	.08¾	.08	.08½
200 vis., 2½-3 color	.09¼	.10¼	.09¼	.10¼	.09	.10
300 vis., 3-3½ color	.10¼	.11¼	.10¼	.11¼	.10	.11
350 vis., 3½-4 color	.11¼	.12	.11¼	.12	.11	.12

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

450 vis., 3½-4 color	.12	.12¾	.12	.12¾	.12	.12½
550 vis., 3½-4 color	.12¾	.13¼	.12¾	.13¼	.12½	.13¼
Red Neutral:						
200 vis., 4½-5 color	.09¾	.10¼	.09¾	.10¼	.09½	.10
300 vis., 5-6 color	.10½	.11	.10½	.11	.10¼	.10¾
500 vis., 4½-5 color	.12¾	.13½	.12¾	.13½	.12¼	.13
600 vis., 6½ plus color	.13½	.14¼	.13½	.14¼	.13	.13½
700 vis., 6½ plus color	.14½	.15¼	.14½	.15¼	.14	.15

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) EXPORT PRICES

	Oct. 20		Oct. 13		Oct. 6	
Gasoline, U. S. Motor, 58-60, 437 e.p.	.05¼	.06	.05¼	.06¼	.05¼	.06¼
Kerosene, water white, 41-43	.05		.05		.05	
*Fuel Oil, Bunker "C,"	.60		.70		.70	
†Fuel Oil, Diesel, 28-30, per bbl.	1.30		1.40		1.40	
Gas Oil, 28 gravity plus	.04		.04		.04	
25 pale Paraffin Oil, tank car	.10¼		.10¼		.10¼	
28 pale Paraffin Oil, tank car	.07¼		.07¼		.07¼	
280 red Paraffin Oil, tank car	.12½		.12½		.12½	
250 red Paraffin Oil, tank car	.11½		.11½		.11½	
225 red Paraffin Oil, tank car	.10		.10		.10	
200 red Paraffin Oil, tank car	.09¼		.09¼		.09¼	
Domestic heating oil, min. 32 grav., tank car	.03½		.03½		.03½	
Refined Wax:						
120-122 a.m.p., per lb.	.02¾		.02⅞		.02⅞	
125-127 a.m.p., per lb.	.02⅞		.03		.03	
130-132 a.m.p., per lb.	.03⅜		.03½		.03½	
133-135 a.m.p., per lb.	.04		.04		.04	
135-137 a.m.p., per lb.	.04½		.04½		.04½	
Petroleum in barrels in carload lots, per pound:						
Dark Green	.01¾		.01¾		.01¾	
Amber	.02½		.02½		.02½	
Extra Amber	.03		.03		.03	
Cream	.05½		.05½		.05½	
Lily White	.06½		.06½		.06½	
Snow White	.07		.07		.07	

*Lighterage 5 cents a barrel extra. †Lighterage 6.5 cents a barrel.

NEW YORK (BAYONNE) REFINERY PRICES

	Oct. 20		Oct. 13		Oct. 6	
600, steam refined cylinder stocks, in bbl.	.22	.22½	.22	.22½	.21	.22
635, steam refined	.23½	.24	.23½	.24	.23	.24
650, steam refined	.25	.25½	.25	.25½	.24½	.25
600, Pennsylvania Flash	.26	.27	.26	.27	.26	.27
650, Pennsylvania Flash	.30	.31	.30	.31	.30	.31
600, Warren E	.25	.26	.25	.26	.25	.26
600, Oil City E	.24	.25	.24	.25	.24	.25
Light 140-150 Bright Stocks	.35	.36	.35	.36	.35	.36
Dark 140-150 Bright Stocks	.34	.35	.34	.35	.34	.35

LOS ANGELES EXPORT PRICES

	Oct. 20		Oct. 13		Oct. 6	
Kerosene, water white	.04	.04¾	.04	.04¾	.04	.04¾
U. S. Motor gasoline, 53-55 437 e.p.	.04¼	.05	.04¼	.05	.04¼	.05
58-60 400 endpoint gasoline	.04¾	.05½	.04¾	.05½	.04¾	.05½

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

East Texas† ..... $ .68
Corsicana heavy (Aug. 22, 1931)† ..... .34
Other fields ..... See gravity table

†Posted by Panola Pipe Line Co. Aug. 17, 1931; by Magnolia Petroleum Co., Aug. 22, 1931; Tidal Refining Co., Sept. 2; Gulf Pipe Line Co., Sept. 3; Sinclair Refining Co., Sept. 3.

Note—Humble Oil & Refining Co. and Stanolind Crude Oil Purchasing Co. also pay 68 cents for East Texas oil, but do not post a price.

EASTERN STATES

Joseph Seep Purchasing Agency
(Effective September 12, 1931)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field) (Oct. 15, 1931) $2.15
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.80
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia) 1.70
Penna Grade Oil in Buckeye Pipe Line Lines (Sept. 4, 1931) 1.60
Corning Grade Oil in Buckeye Pipe Line Co.'s Line (Sept. 18, 1931) ..... .80
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 10, 1931) ..... .60
Wayne district Oil in Cumberland Pipe Lines (April 23, 1931) 1.17

Tide Water Pipe Co.
(Effective October 15, 1931)

Bradford, Pa., crude $2.15
Allegany, N. Y., crude 2.15

Pure Oil Co.
(Effective September 12, 1931)

Cabin Creek, W. Va. $1.70
Bradford Hollow, W. Va 1.70

Pennzoil Co.
(Effective October 8, 1931)

Pennsylvania Grade Oil in National Transit Lines:
Group A $2.05
Includes Cochran, Franklin, Hamilton and Doolittle districts.
Group B $2.04
Includes Titusville district.
Group C $2.03
Includes Turkey and Tidioute districts.
Group D $2.02
Includes Bear Creek and Porkey districts.
Group E $2.00
Includes Eldenau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kennerdell, Emlenton, Tiona, Lacy and Kinzua districts.

*Price depends on length of pipe line haul to plant at Oil City.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties ..... See gravity table

WEST TEXAS

Iatan and Westbrook ..... Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Ector, Winkler and Pecos Counties* ..... $ .35
Lea County, N. Mex.* ..... .35
Toborg, Pecos County, Aug. 25, 1931† ..... .25

*The Texas Company, August 22, 1931. All other companies, August 22. †Shell Petroleum Corp.

GULF COAST

Grade A and Grade B classifications discontinued by leading buyers ..... See gravity table
Jennings, La. (Aug. 22, 1931)* ..... $ .50
Lockport, La. (Aug. 27, 1931)† ..... See Gulf Coast gravity table
Refugio light ..... See gravity table
Refugio heavy (Aug. 22, 1931)‡ ..... .60
Markham (Aug. 22, 1931)§ ..... .52
High Island (Aug. 22, 1931)¶ ..... See Gulf Coast gravity table .50

*Gulf Refining Co. †Vacuum Oil Co. ‡Humble Oil & Refining Co. §The Texas Company. Other companies July 24. ¶Gulf Pipe Line Co.

NORTH LOUISIANA AND ARKANSAS

Smackover, Ark. (all grades) See note below
Urbana, Ark. ..... See note below
Bellevue, La. (June 3, 1931) ..... $ .25
Urania, La. (Aug. 24, 1931) ..... .40
Calion, Ark. (Aug. 22, 1931) ..... .52
East El Dorado, Ark. (Aug. 22, 1931) ..... .45
Stephens, Ark., below 29° (August 24, 1931) ..... .41
Stephens, Ark., 29° and above (August 24, 1931) ..... .44
Other fields ..... (See gravity table)

Note—Smackover, all grades, The Texas Company, August 22, 1931 52 cents; Gulf

(Continued on Page 94)

CRUDE OIL GRAVITY TABLE

	Okla., Kans., East Central and North Central Texas (1)	North Louisiana and Arkansas (2)	Gray County, Texas (3)	Carson and Hutchinson Counties, Tex. (4)	Salt Creek, Wyo. (5)	Gulf Coast (6)
Below 25 degrees	...	...	...	...	...	.55
25-25.9 degrees	...	...	...	...	...	.56
26-26.9 degrees	...	...	...	...	...	.57
27-27.9 degrees	...	...	...	...	...	.58
28-28.9 degrees	...	...	...	...	...	.59
Below 29 degrees	.46	.46	...	...	.46	...
29-29.9 degrees	.48	.48	...	...	.48	.60
30-30.9 degrees	.50	.50	...	...	.50	.61
31-31.9 degrees	.52	.52	...	...	.52	.62
32-32.9 degrees	.54	.54	...	...	.54	.63
33-33.9 degrees	.56	.56	...	...	.56	.64
34-34.9 degrees	.58	.58	.46	.41	.58	.65
35-35.9 degrees	.60	.60	.48	.43	.60	.66
36-36.9 degrees	.62	.62	.50	.45	.62	.67
37-37.9 degrees	.64	.64	.52	.47	.64	.68
38-38.9 degrees	.66	.66	.54	.49	.64	.69
39-3.99 degrees	.68	.68	.56	.51	.64	.70
40 degrees and above	.70	.70	.58	.53	.64	.71

Note—Magnolia Petroleum Co. does not pay on a gravity basis. The Magnolia company posted the following notices on August 22 and August 24 as indicated:

"Effective August 22, 1931, and until further notice our prices on crude oil will be as follows per barrel at the wells: Central Texas, which includes only Mexia, Wortham, Corsicana light, Panola County, and Lytton Springs, 64 cents; Panhandle district of Texas, Gray County, 58 cents; Carson and Hutchinson Counties, 51 cents; West Texas, being Crane, Upton, Howard, Glasscock and Mitchell Counties, 35 cents; Mirando, 60 cents; Darst Creek, 52 cents; Luling, 34 cents; Corsicana heavy, 34 cents. Oklahoma, including Cushing, Yale, Oklahoma City, Morrison, Wewoka and Seminole, 68 cents; Cement, Duncan, and Walters, 60 cents; Healdton, 37 cents; Hewitt and Graham, 52 cents. North and Central Texas, including only Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden, 68 cents; East Texas, 68 cents. The White Eagle Oil Corp., effective September 28, posted the following prices in Kansas: Group 1—Eastborough, Wright, Robbins, Greenwich, Lorena and North Greenwood Pools, 70 cents; Group 2—Eastman, Fox-Bush and Keighly, 68 cents; Group 3—Smock, Sluss, Leon, Weaver, Peabody and Rock, 66 cents; Group 3A—Ritz-Canton, 64 cents; Group 4—Urschell, Florence, Elbing, Nuttle-Koogler, Augusta, 62 cents; Group 5—Gelwick, 46 cents.

Effective August 24, 1931, Magnolia Petroleum Co.'s prices on crude oil in the states of Louisiana and Arkansas will be as follows per barrel at the wells: Louisiana, Bull Bayou, 68 cents; Haynesville, 50 cents; Pine Island, 58 cents; Cotton Valley, 46 cents. Arkansas, El Dorado and Rainbow, 48 cents; El Dorado East Field and Smackover district, 45 cents.

Column 1—The Texas Company (excepting Kansas), August 22; Gypsy Oil Co., Gulf Pipe Line, Carter Oil Co., Humble Oil & Refining Co., Stanolind Crude Oil Purchasing Co., Sinclair Refining Co., Continental Oil Co., Skelly Oil Co. (Kansas), Empire Pipe Line Co., Wilcox Oil & Gas Co., Tidal Refining Co., Pure Oil Co., Vickers Petroleum Co., Derby Oil Co., all on August 22. Standish Oil Co., September 17, 1931.

Column 2—The Texas Company, August 22; Gulf Refining Co., August 22; Standard Oil Co. of Louisiana, August 24; Louisiana Oil Refining Co., August 24.

Column 3—The Texas Company, August 22; Gulf Pipe Line Co., August 22; Humble Oil & Refining Co., August 22; Wilcox Oil & Gas Co., September 17, 1931; Philtex Oil Co., September 17, 1931.

Column 4—The Texas Company, August 22; Gulf Pipe Line Co., August 22; Humble Oil & Refining Co., August 22; Philtex Oil Co., September 17, 1931.

Column 5—The Mid West Refining Co., August 22.

Column 6—The Texas Company, August 22; Humble Oil & Refining Co. and Gulf Pipe Line Co. on August 22 but their price schedule stops at 35 and above at 66 cents. Sun Oil Co. and Sinclair Refining Co. met Humble-Gulf prices effective August 22, but Sun posted a price of 65 cents for Grade A oil, it being the only company that maintains A and B grade classifications. The Vacuum Oil Co. applied the schedule to Lockport on August 27.

CALIFORNIA CRUDE OIL PRICES

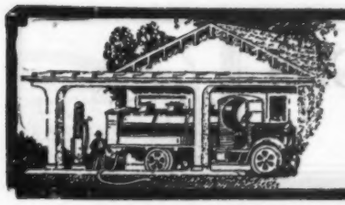
STANDARD OIL CO. OF CALIFORNIA

For its current purchases of crude oil at the well (unless otherwise specified) for allowable crude oil produced in accordance with allocations made by the California Statewide Curtailment Committee. All gravities above those quoted take highest price offered in that field. Effective June 19, 1931, at 7 a. m.

Gravity	Signal Hill	Seal Beach, Alamitos Heights	Huntington Beach	Inglewood	Olinda-Brea Canon	Torrance	Richfield	Coyote Hills	Santa Fe Springs	Midway-Sunset, Elk Hills, Buena Vista Hills	Lost Hills
14-14.9	$.65	$.65	$.65	$.65	$.65	$.65	$.65	$.65	...	$.55	$.55
15-15.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
16-16.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
17-17.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
18-18.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
19-19.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
20-20.9	.65	.65	.65	.66	.66	.65	.65	.65	...	.55	.55
21-21.9	.65	.65	.65	.68	.67	.65	.66	.65	...	.55	.57
22-22.9	.65	.65	.66	.70	.68	.66	.68	.65	...	.56	.59
23-23.9	.67	.67	.68	.72	.70	.67	.70	.66	...	.58	.60
24-24.9	.69	.69	.70	.74	.72	.68	.72	.67	$.65	.61	.62
25-25.9	.71	.71	.72	.76	.74	.70	.74	.69	.65	.64	.64
26-26.9	.73	.73	.74	...	.76	...	...	.71	.65	.66	.66
27-27.9	.75	.75	.76	...	.78	...	...	.73	.68	.68	.67
28-28.9	.77	...	...	...	.80	...	...	.75	.71	.71	.69
29-29.9	.79	...	...	...	...	...	...	.77	.73	.74	.71
30-30.9	.81	...	...	...	...	...	...	.79	.75	.76	.73
31-31.9	...	...	...	...	...	...	...	...	.78	...	...
32-32.9	...	...	...	...	...	...	...	...	.80	...	...
33-33.9	...	...	...	...	...	...	...	...	.83	...	...
34-34.9	...	...	...	...	...	...	...	...	.85	...	...
35-35.9	...	...	...	...	...	...	...	...	.87	...	...

Standard Oil Co. of California prices in other fields:
Wheeler Ridge—55 cents per barrel for all grades (14° to 25.9°).
Coalinga—55 cents for all grades from 14° to 24-24.9°; 57 cents for 25 gravity.
Newhall, McKittrick and Kern River—55 cents for all grades (14° to 19.9°).
Montebello—65 cents for all grades (14° to 25.9°).
Whittier and LaHabra—65 cents for all grades (14° to 22.9°).
Elwood Terrace, f.o.b. ship—33° to 33.9°, 79 cents; 34° to 34.9°, 81 cents; 35° to 35.9°, 84 cents; 36° and above, 87 cents.
Playa Del Rey—Prices subject to field gathering charge of 5 cents per barrel—19° to 19.9°, 65 cents; 20° to 20.9°, 65 cents; 21° to 21.9°, 66 cents; 22° to 22.9°, 67 cents; 23° to 23.9°, 68 cents; 24° to 24.9°, 67 cents; 25° and above, 68 cents.

(Continued on Page 103)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Oct. 20

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Chicago	14 0	14.6	3.0	9.0
Decatur, Ill.	14.4	14.4	3.0	9.0
E. St. Louis	13.7	13.7	3.0	8.2
Joliet	14.4	14.4	3.0	9.0
Peoria	14.4	14.4	3.0	9.0
Quincy	14.2	14.2	3.0	8.5
Davenport, Ia.	14.5	13.5	3.0	9.3
Des Moines	14.5	13.4	3.0	8.0
Keokuk	14.5	14.5	3.0	8.3
Sioux City	14.1	14 1	3.0	8.9
Duluth, Minn.	15.5	15.5	3.0	9 9
Mankato	15.1	15.1	3.0	8.0
Minneapolis	15.3	13.4	3.0	9.9
La Crosse, Wis.	16.3	16.3	4.0	10.0
Milwaukee	15.1	15.1	4.0	8.9
Madison	15.3	15.3	4.0	9.1
Detroit, Mich.	14.5	14 5	3.0	10 7
Grand Rapids	14.7	14.7	3.0	10 6
Saginaw	14.9	14.9	3.0	10.5
Evansville, Ind.	15.1	15.1	4 0	9.9
Indianapolis	15.3	15.3	4.0	9.0
South Bend	15 4	15.4	4.0	10.3
Fargo, N. D.	16 9	16.9	3.0	11.9
Huron, S. D.	16 3	16.3	4.0	10.7
Sioux Falls	15 8	15.8	4.0	10.4
K. C., Mo.	13 9	13 9	3.0	7.6
Springfield*	13.9	13.9	3.0	8.5
St. Louis*	12 4	12 4	2 5	8.3
St. Joseph	11.4	9.4	3 0	7 5
Wichita, Kans.	13.8	13.8	3.0	7.8
Bartlesville, Okla.	13.0	16.0	5.0	7.0

*State tax 2 cents, remainder city tax.

A third grade of gasoline, "Stanolind Blue," is sold at all major points at a price 3 cents or more below the price on the regular grade.

Effective April 15—Discounts on Q.D.A. on 1,000 gallons or more per month throughout territory; Red Crown Ethyl Gasoline, 3 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price. On deliveries of 75,000 gallons or more each classification allowed 1 cent additional discount.

Discounts on resellers authorized agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Dallas, Tex.	13.0	14.0	4.0	8 0
Fort Worth	13 0	14 0	4.0	8 0
Houston	13 0	14.0	4.0	11 0
San Antonio	13 0	14.0	4.0	10 0
El Paso	14 0	16.0	4.0	12.0
Texarkana	13 0	14 0	4 0	11 0
Muskogee, Ok.	12 0	14.0	5.0	8 0
Okla. City	13.0	15.0	5 0	7 0
Tulsa	13.0	15.0	5.0	8 0
Ft. Smith, Ark.	*15.5	16 5	5 0	11 0
Little Rock	*16.5	17.5	6.0	11.0

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

*Less 2 cents to dealers.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Omaha	15 25	16.25	4 0	9.25
McCook	16 00	17 75	4.0	10.75
Norfolk	15.75	16 75	4 0	9 75
N. Platte	16 75	17 75	4.0	10.50
Scottsbluff	16.00	16.00	4.0	10.25

Note—Dealers' discount allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off normal service station price; Nebraska Blue (third grade) 1 cent off normal service station price.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Denver, Colo.	14.0	17 0	4.0	13.5
Pueblo	13 0	15 0	4.0	12 0
Grand Jctn.	17 0	20 0	4.0	14.5
Casper, Wyo.	14.0	17.0	4.0	10.0
Cheyenne	15.0	18.0	4.0	11 5
Butte, Mont.	17.0	20.0	5 0	16 0
Billings	20 0	20.0	5 0	14.5
Great Falls	20 0	22 0	5 0	16 0
Helena	20.0	23.0	5.0	16.0
Salt Lake, Utah	17.5	20.5	4 0	16.0
Albu'que, N. M.	17.0	20 0	6.0	14 0
Boise, Idaho	20.5	23 5	5.0	18.0
Twin Falls†	*20 5	21.0	5.0	18 0

†2½-cent discount off tank wagon to dealers.

PACIFIC COAST TERRITORY

	Gasoline			Kero.
	Wh'le's'e price	Retail* price	Incl'ds tax	tank wagon
Fresno	19.5	16 5	3.0	17 0
San Francisco	19 5	16 5	3.0	15.5
Los Angeles	19.0	16.0	3.0	15.5
Reno, Nev.	23 5	20.5	4.0	19 0
Portland, Ore.	21 0	18 0	4 0	16 5
Seattle, Wash.	22.0	19 0	5.0	16 5
Tacoma	22 0	19.0	5 0	16 5
Spokane	25.5	22.5	5.0	20.5
Phoenix, Ariz.	15.5	16.0	5.0	20.0

Above prices are at company's plant or depots as company does not operate stations. A 6-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 3 cents plus a 3-cent special temporary discount subject to withdrawal at any time.

*Retail prices posted by Standard Stations, Inc., a subsidiary.

PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Pittsburgh, Pa.	*11.0	*13.0	...	11 0
Philadelphia	*10.0	*10 0	...	11 0
Scranton	*11 0	*12 0	...	11.0
Allentown	*11 0	*12 0	...	11.0
Altoona	*11 0	*12 0	...	11 0
Erie	*11 0	*12 0	...	11.0
Dover, Del.	14.0	15.0	3 0	11 0
Wilmington	14.0	15.0	3 0	11 0
Springf'd, Mass.	13.0	13 0	3.0	10 0
Worcester	14.3	15 3	3 0	10 0
Boston	13.5	14 5	3 0	10.0
Providence, R.I.	12 1	13 1	3 0	10 0
Hartford, Conn.	13.0	14.0	3 0	10 0
New Haven	14.6	15.6	3.0	10.0

*Does not include tax of 3 cents in Pennsylvania. Pennsylvania tax is collected by the dealer and paid by him direct to the State. The above prices are subject to discounts to the dealers and to commercial accounts under contract for one year in accordance with Code of Ethics.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
N. Orleans, La.	14 5	14 5	6.0	12 0
Baton Rouge	15 0	16.0	5 0	12 0
Alexandria†	15.0	17.0	6.0	12.0
Lafayette*	16.0	17.0	6.0	12.0
Lake Charles*	15 0	15 0	6 0	12 0
Shreveport	15 5	16.5	5.0	12.0
Knoxville, Tenn.	18.5	19.5	6.0	12.5
Memphis	15 5	16 5	6 0	10.0
Chattanooga	18.0	19.0	6.0	12.0
Nashville	17.5	18.5	6.0	12.5
Bristol	18.0	19.0	6 0	14.0
Lt. Rock, Ark.	16.5	17.5	6.0	11.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

Two-cent discount off gasoline and kerosene tank wagon price to dealer and commercial accounts.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Atl'tic City, N.J.	14 7	15 7	3.0	11 5
Newark	13.7	14.7	3 0	10.5
Annapolis, Md.	15 2	16.2	4.0	11.0
Baltimore	14.4	15.4	4.0	8.5
Cumberland	16.2	17.2	4 0	12.0
Wash'ton, D. C.	12.9	13 9	2.0	10 7
Danville, Va.	17.0	18.0	5.0	11 8
Norfolk	15.5	16 5	5 0	10.3
Petersburg	16 5	17 5	5.0	11 3
Richmond	15.9	16 9	5.0	10 7
Roanoke	17.2	18.2	5 0	13.0
Charles'n, W.Va.	15.7	16.7	4.0	11 5
Keyser	16 2	17 2	4 0	13.1
Parkersburg	14.4	15.4	4.0	10.2
Wheeling	15 6	16.6	4 0	11.4
Charlotte, N. C.	17 0	17 0	6 0	10.7
Hickory	18.8	19 8	6 0	12 6
Mount Airy	18.7	19 7	6 0	12.5
Raleigh	18 4	19.4	6 0	12 2
Salisbury	18.7	19.7	6 0	12 5
Charleston, S.C.	16 5	17 5	6 0	10.2
Columbia	18 4	19 4	6.0	12 2
Spartanburg	18.7	19.7	6.0	12.5

Two cents per gallon discount off retail tank wagon price of gasoline to dealers except Washington, D. C., and State of Maryland and New Jersey, where discount is 3 cents.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Albany, N. Y.	16 6	17 6	2 0	15.6
New York*	15.3	15 3	2 0	14 3
Buffalo	15.8	15 8	2 0	14.8
Rochester	16 0	16 0	2.0	14 0
Syracuse	16 8	16 8	2 0	14.8
Boston, Mass.	16 5	16 5	3 0	13 5
Augusta, Me.	18.8	18.8	4.0	14.8
Manch'tr, N. H.	18 4	18.4	4.0	14 0
Burlington, Vt.	19.3	19.3	4.0	15.3

*Prices in steel barrels.

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Ohio points	15.0	16.0	4.0	*12.0

Dealers and commercial accounts 2 cents under tank wagon.

*Service station price 13 cents.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax	tank wagon
Atlanta, Ga.	18 0	18 0	6 0	12.5
Augusta	19.0	20 0	6 0	14.0
Macon	19.0	19 0	6 0	12 0
Savannah	17.0	17.0	6 0	12.0
Birm'ham, Ala.	15.5	15 5	6 0	13.0
Mobile	19 5	19.5	6.0	10 0
Montgomery	19 0	19 0	5 0	13.5
Clarks'le, Miss.	18.0	20.0	5.0	13 5
Jackson	15 5	15.5	5 0	11 5
Natchez	18.0	20 0	5 0	13.5
Gulfport	16 0	16 0	5 0	13 5
Vicksburg	15 5	15 5	5.0	11 5
Jack'ville, Fla.	19 0	19 0	7.0	12 0
Miami	19.0	19.0	7.0	13.0
Pensacola	20 0	21 0	7.0	13.0
Tampa	18 0	18 0	7 0	13.0
Lexington, Ky.	18 0	19.0	6 0	12.0
Covington	17.0	19.0	6 0	11.0
Louisville	17.0	18.0	6.0	10.0
Ashland	17.0	19.0	6 0	13.0
Paducah	18 0	18.0	6.0	11.0
Bowling Green	19.0	21.0	6.0	14.5
Corbin	18.0	19.0	6.0	15.0

A third grade "Kyso Green," is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery and Birmingham state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents. To Mobile state tax add 1-cent city tax and 2½ cents county tax.

Effective April 2 price to dealers 2 cents under posted tank wagon price.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	10.7	6 0
V.M.P. naphtha	12 7	7 5
Cleaners' naphtha	14.2	9 0
Stanisol	14.2	9.0

Tank wagon prices f.o.b. Chicago and Whiting, effective July 2.

STANOLIND FURNACE OIL IN CHICAGO

Effective July 1, prices f.o.b. Chicago, tank wagon prices: 1 to 99 gallons, 8 cents; 100 gallons or more 6 cents.

Stanolax Fuel

Effective May 9, f.o.b. Chicago, tank wagon prices: 1 to 199 gallons, 7 cents; 200 gallons or more, 5 cents. Sinclair met this by bringing down the price of its No. 2.

Fuel Oils

Chicago tank wagon prices (in lots of 400 gallons and over): 33-40 straw distillate, 6 cents; 32-36 gas oil (light zero), 5.5 cents; 32-36 gas oil (industrial), 5.25 cents; 28-30 zero fuel oil, 5 cents; 24-26 fuel oil, 4.25 cents; 18-22 fuel oil, 3.75 cents.

CRUDE OIL PRICE CHANGES

Effective October 15, the Tide Water Pipe Co. reduced the price of Bradford, Pa., and Allegany, N. Y., crude oil (Pennsylvania Grade) 15 cents, making the new price $2.15 per barrel. On the

(Continued on Page 103)

CRUDE OIL PRICES

(Continued from Page 93)

Refining Co., August 22, 45 cents; Magnolia Petroleum Co. and Standard Oil of Louisiana, August 24, 45 cents. Urbana posting discontinued by Standard Oil Co. of Louisiana on August 24, 1931. Bellevue posted by Magnolia Petroleum Co.; Urania by Louisiana Oil Refining Co.; Calion by Gulf Refining Co.; East El Dorado by Gulf Refining Co. and Magnolia Petroleum Co.; Stephens, Ark., by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (Aug. 22, 1931)*	$ .52
Luling (Aug. 22, 1931)†	.34
Mirando (Aug. 22, 1931)*	.49
Pettus (Aug. 22, 1931)*	.70
Salt Flat (Aug. 22, 1931)*	.52
Thrall§	
Lytton Springs (Lockhart). See gravity table	
Dobrowolski¶	
Same as Mid-Continent gravity scale up to and including 38-38.9°.	
Somerset‖	
Same as Mid-Continent gravity scale up to and including 38-38.9°.	

*Texas, Humble and Gulf all posted on August 22. †Magnolia Petroleum Co. §Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products. ‖Pioneer Oil & Refining Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.

Ilea, light (Aug. 24, 1931)	$ .71
Ilea, heavy (Aug. 24, 1931)	.61
Fort Collins (Aug. 24, 1931)	.61
Florence (Aug. 24, 1931)	.59
Wellington (Aug. 24, 1931)	.61
Dutton Creek (Aug. 24, 1931)	.60
Rock Creek, Wyo. (Aug. 24, 1931)	.70
Frannie, light (Aug. 24, 1931)	.54
Frannie, heavy (Aug. 24, 1931)	.42
Salt Creek.....Mid-Continent gravity table	
Big Muddy (Aug. 24, 1931)	.61
Grass Creek (Aug. 24, 1931)	.50
Elk Basin (Aug. 24, 1931)	.50
Lance Creek (Aug. 24, 1931)	1.05
Poison Spider (Mar. 5, 1931)	.70
Notches (Mar. 14, 1927)	.65
Hudson (June 2, 1931)	.65
Lander (Mar. 5, 1931)	.40
Rex Lake (Feb. 22, 1930)	1.70
Osage (Apr. 15, 1931)	.50
Lost Soldier (Aug. 25, 1931)	.54
Hamilton Dome (Mar. 14, 1927)	.65
Greybull (Aug. 24, 1931)	.50
Torchlight (Aug. 24, 1931)	.50
Cat Creek (Aug. 24, 1931)	.50
Pondera (Aug. 24, 1931)	.50
Sunburst, Mont. (Aug. 24, 1931)	.50
Hogback, N. Mex. (Aug. 24, 1931)	.50
Lea County, N. Mex. (Aug. 24, 1931)	.50
Border, Mont.	1.55
Red Coulee, Alberta	1.55
Dry Creek, Mont. (Aug. 24, 1931)	1.00
Maljamar (Aug. 22, 1931)	1.00
Artesia-Jackson (Aug. 22, 1931)	.55

Note—Salt Creek, Cat Creek, Dry Creek, Dallas-Derby, Hudson, Greybull and Hogback posted by Midwest Refining Co. and remainder by Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin, Lost Soldier posted by Producers & Refiners Corp. Artesia, Jackson and Maljamar posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Ohio Oil Co. ceased posting Artesia on March 5, 1931. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by the Continental Oil Co. Osage posted by Arro Oil & Refining Co.

MIDDLE WESTERN STATES

Ohio Oil Co.

(Effecive August 24, 1931)

Lima	$ .90
Wooster	1.00
Illinois	.80
Indiana	.80
Princeton	.80
Plymouth	Shut in
Western Kentucky	.75
Midland, Mich.* Oct. 9	.55
Dundee, Mich.†	
Same as Stanolind Crude Oil Purchasing Co.'s Mid-Continent gravity scale	
Upper and Lower Traverse Sands, Mich.†	
....Same as Mid-Continent gravity scale	
Somerset, Ky. (Sept. 26, 1931)	.61
Hart County, Ky. (Oct. 1, 1931)§	.50

*Posted by Pure Oil Co. †Posted by Standard of Indiana for boat shipment. ‡Posted by Stoll Refining Co. Somerset, Ky., crude purchased by Ashland Refining, Ashland, Ky., and delivered through Cumberland Pipe Line.

MEXICO

Panuco*	$ .45

*F.o.b. ship, based on September transactions and exclusive of production and export taxes and bar dues.

CANADA

Ontario (Aug. 24, 1931):	
Petrolia*	$1.50
Oil Springs*	1.57
Alberta (Aug. 24, 1931):	
Turner Valley:†	
Crude oil 45-49.9	2.00
Crude oil 50 and above	2.05
Crude naphtha	2.12
Discolored naphtha	2.50

*Imperial Oil, Ltd. †Imperial Oil, Ltd., and Regal Oil & Refining Co.

Of Interest to Sales Departments

Argentina Moves To Stop Dumping Foreign Gasoline

WASHINGTON, D. C., Oct. 17.—The Argentine Republic is moving to prevent the dumping of gasoline within its ports by the Soviet Republic of Russia.

Information just received here is to the effect that a decree dated August 7 has been issued by the provisional government establishing special measures against the dumping of foreign products in Argentina.

While these measures apply to all imported products their chief interest in the Argentine appears to be their effect in preventing the dumping of Russian gasoline.

The decree establishes that the executive power shall provisionally apply new or higher customs tariffs under the following circumstances:

"When a foreign country concedes subsidies, premiums or other advantages to products destined for exportation;

"When subventions, premiums, exemptions or other advantages are conceded the transporting of foreign products or to the persons who intervene in their negotiation;

"When foreign products, favored by special circumstances, such as legislation in general, value of the money, low wages, forced labor or any other form of dumping harms the Argentine production."

These modifications are to remain in force "provided the executive power decides to maintain them, until such time as Congress decides to maintain, reduce or suppress them."

This decree was issued after the forcible closing of the Iuyamtorg Co., the Russian sales agency in Buenos Aires, by the police and the seizure of its records. It is stated on reliable authority that as a result of the information obtained from the records of the Iuyamtorg Co. it has been revealed that this Russian sales agency has attempted to market large quantities of gasoline in Argentine at a reduced price through agreements with the Argentine government. A report of the provisional government published in Argentina, it is stated, shows two unsuccessful attempts on the part of the Iuyamtorg Co. to bring about such an agreement.

It is stated that a draft of a contract was made in August, 1930, and found in the records of the Iuyamtorg Co., between that company and the minister of agriculture of the Irigoyen government, providing for the annual sale by the company to the Argentine government of 250,000,000 liters of gasoline to be delivered at Argentine ports at a price equal to that prevailing in the world markets and payable in dollars or gold pesos. Freight insurance, tare and interest were to be paid by the Argentine government. This first attempt of the Iuyamtorg Co. to sell gasoline to the Argentine government, it is stated, fell through after the Irigoyen government was overthrown by the revolution of September 6.

A second attempt was made by the Iuyamtorg Co. when its representative proposed to President Uriburu to sell the Argentine not less than 50,000,000 pesos worth of gasoline annually, the payment for which was to be spent for the purchase of Argentine hides, wool, bulls and other livestock products for exportation to Russia. This gasoline it is stated, was to be brought by the Argentine government at a price lower than the cost of production in Argentina and to be resold by the government at a substantial profit.

It was seen, it is said, that such an agreement would disrupt the Argentine oil industry, as the total estimated consumption of gasoline for 1930 was 900,000,000 liters. The Argentine cabinet refused this offer.

These statements have only recently been made public in Argentina and it is also stated a third attempt of the Russian government to sell gasoline through private channels has been made within a few months past. These events are cited as the background for the recent decree of August 7 to prevent any threatened dumping of gasoline in Argentina. —C. E. K.

DERBY TO TEST COLORADO LAW COVERING GASOLINE COLORING

DENVER, Colo., Oct. 19.—The Derby Oil Co., of Kansas, has obtained in the Denver district court a temporary injunction restraining James Duce, Colorado state oil inspector, Clarence Ireland, attorney general of Colorado, and 14 district attorneys, from "threatening, harassing, persecuting, penalizing, cancelling the licenses of or in any manner interfering with the business of" the Kansas company or its customers in the state under the provisions of a law enacted by the last general assembly regarding the coloring of gasoline. The restraining order is subject to the posting of a $2,500 emergency bond by the plaintiff. The suit is looked upon as a test case.

The general assembly in the spring of 1931 enacted House Bill No. 162 which among other provisions contains a clause concerning the artificial coloring of gasoline which reads as follows: "The artificial coloring of motor fuel offered for sale is hereby prohibited, except when such coloring is used to identify special qualities, and then only under a license specifying the special qualities claimed, such license to be granted by the state inspector of oils after an investigation of the claimed special qualities, which license may be on forms prescribed by the state inspector of oils. If, at any time after the granting of such license, it is found by said inspector that the licensee is offering for sale a motor fuel containing such coloring, which does not possess the special qualities upon which the license was granted, the said inspector shall forthwith cancel such license."

Under the provisions of the clause the inspector recently warned a number of dealers handling colored brands that unless the practice was discontinued, the dealers' licenses would be revoked. The sale of these brands, with one exception, was discontinued. The marketers and dealers handling Ethyl gasoline were the only ones granted licenses for handling colored motor fuel.

The Derby company brought its test suit through the law firm of Enos, Healy & Chisholm, of Denver. The complaint alleges that red coloring is a symbol established by the government during the war to identify "antiknock" gasoline and that it is an established symbol known to the motoring public. It declares its own brand of red gasoline possesses special antiknock qualities and should, therefore, be permitted to be sold under the Colorado law. The complaint sets forth that Inspector Duce has been supplied with test data on the company's brand showing these qualities, but that a license has been refused and that its customers have been threatened with prosecution if it continues to handle the product in this State. The court is asked to define the oil inspector's rights to discriminate in granting licenses and to interpret the law. It also asks for a permanent injunction. If the inspector's interpretation of the law is correct, the complaint says, then the law is unconstitutional.

GOVERNMENT CALLING FOR FUEL OIL BIDS

WASHINGTON, D. C., Oct. 17.—Bunker fuel oil "A" and "C" grades for the East Coast and lubricating oil for oriental ports is called for by the Navy Department. Fuel oil bids must be in Washington by November 13 and lubricating oil bids must be delivered here by November 3.

Bids desired are for bunker fuel oil "A" grade 35,000 bbls. delivered at New London, Conn.; 150,000 bbls. at New York.

Bunker fuel oil "C" grade, 175,000 bbls., New York. "A" grade, 80,600 bbls., Philadelphia; "C" grade, 35,300 bbls., Philadelphia; "A" grade, 800 bbls., Indian Head, Md.; "C" grade, 35,000 bbls., Norfolk, Va.; "C" grade, 5,000 bbls., Charleston, S. C.; "C" grade, 20,000 bbls., Savanah, Ga.; "C" grade, 25,000 bbls., New Orleans, La.; "C" grade, 9,000 bbls., Beaumont, Tex.; "A" grade, 40,000 bbls., Galveston, Tex.; "C" grade, 5,000 bbls., points on Houston Ship Channel, Texas; "C" grade, 25,000 bbls., Port Aransas, Tex.; "C" grade, 20,000 bbls., Port Arthur, Tex.; "A" grade, 535,000 bbls., United States Gulf ports.

For delivery at Manila, Cavite, Philippine Islands, Hong Kong, Canton, Shanghai, Tiensten, Swatow, Hankow, Tsingtau and Chefoo, China; Darien, Manchuria; Nagasaki and Kobe, Japan, during 1932, 168,000 gallons for lubricating oil of varying grades is wanted.

Prospective bidders should get necessary forms for making proposals by addressing Bureau of Supplies, Navy Department, Washington, D. C.—C. E. K.

STEAUA ROMANO CLOSES CONTRACT WITH SPAIN

WASHINGTON, D. C., Oct. 19.—Cable advice from Paris, France, states that it is reported the Steaua Romano has just concluded a contract with the Spanish government for the annual delivery of 175,000 tons of petroleum products. The Steaua Romano is the Rumanian oil company that recently delivered 15,000 bbls. of gasoline at Detroit, Mich.

It was also reported that the Steaua Romano stock now held by the Rumanian government will be ceded to the Franco-British group that already holds a large block of the oil company's stock.

It will be remembered that 51 per cent of the stock of the Steaua Romano, held by the Germans before the war, was acquired by a syndicate of the principal banks of Bucharest, payable in scaled payments. The last payments fall due at a moment of financial crisis and the Rumanian government took over this block of stock from the defaulting banks. These are the shares that in all probability will soon pass into the hands of the Franco-British consortium, giving the entire control to France and England.—C. E. K.

GULF BUYS TANKS

PITTSBURGH, Pa., Oct. 19.—The Gulf Refining Co. has awarded contracts to the McClintic-Marshall Corp. for construction of 26 tanks, to be placed at various distributing points of the company in the western Pennsylvania area.

Government to Give Data on Shipments Of Gasoline Pumps

WASHINGTON, D. C., Oct. 19.—For the first time the Census Bureau has compiled statistics on shipments of gasoline and other measuring and dispensing pumps based on data furnished the bureau by 22 identical establishments.

Shipments of gasoline pumps from these 22 factories for the month of May totaled 10,263 power operated pumps and 6,041 hand operated, all valued f.o.b. factory at $1,659,906; for June, 7,735 power operated and 5,019 hand operated, all valued at $1,227,745; for July, 5,742 power operated and 4,585 hand operated, all valued at $957,160. The value of these gasoline pumps for the three months aggregated $3,844,811.

These shipments are indicative of the activity of oil companies in the extension of gasoline station facilities and are of particular interest to the trade as they show the different types of pumps now being installed. Of the three months' shipments 535 of the gasoline pumps were blind or piston type (5 gallons or continuous type); 1,827 were 1-gallon stroke; 218 were portable (pump mounted on portable wheeled tanks); 600 were visible (glass bowl measuring container type) of the positive stop mechanical measuring variety and 10,401 were

(Continued on Page 101)

DISCUSS REMEDIES FOR GASOLINE TAX EVASION

Possible remedies for gasoline tax evasion, the costly problem of both state tax collecting agencies and the marketing branch of the petroleum industry, are to be considered during the twelfth annual meeting of the American Petroleum Institute at Chicago November 10 to 12.

A general session of the Institute's Division of Marketing, to be held in the North Ball Room of the Stevens Hotel at 8 p. m., Tuesday, November 10, will be given over largely to this subject. It will be touched upon in the report of the chairman of the division, Edward L. Seubert, Standard Oil Co. of Indiana, Chicago. Other speakers will be Dr. Clyde L. King, secretary of revenue, Commonwealth of Pennsylvania, whose topic is "The Gasoline Tax Evasion Problem and How It Is Being Met in Pennsylvania," and William A. McAfee, Standard Oil Co. of Ohio, Cleveland, who will discuss "Uniform Gasoline Tax Laws to Prevent Tax Evasion."

The Division of Marketing will hold two group sessions also for consideration of other marketing problems. The matter of railway and motor truck competition will be discussed at the group session Wednesday, November 11, at 10 a. m., by Edward F. Loomis, of the National Automobile Chamber of Commerce, New York. F. H. Bowman, Pure Oil Co., Chicago, will speak on "Wholesale and Retail Credits," and C. W. Smith, Standard Oil Co. (Indiana), Chicago, will deliver a paper, "Reducing Waste by Preventing Fires and Accidents."

A second group session will be held at the same hour on Thursday, November 11. Twenty members of the divisional general committee will be elected. Speakers and their subjects will be: "State Specifications for Gasoline," K. G. Mackenzie, The Texas Company, New York; "The Evil of Loaned Equipment," W. H. Ferguson, Continental Oil Co., Denver, Colo.; and "How a State Code Committee Functions," C. J. Guzzo, Gulf Refining Co., Nashville, Tenn., chairman of the Tennessee Code Committee.

Tide Water Associated Not in Merger

Joint Statements Issued by Prairie, Sinclair and Tide Water. Eastern Pipe Line Companies May Distribute Investments

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Oct. 19.—Tide Water Associated Oil Co. will not be involved in the Prairie-Sinclair merger, and early announcement of the details of the latter deal are anticipated, according to reports in financial circles here.

W. S. Fitzpatrick, chairman of the board of Prairie Oil & Gas Co., considerably clarified the merger situation when he said: "There has been so much public discussion about the consolidation of the Sinclair Consolidated Oil Corp., Prairie Oil & Gas Co., Prairie Pipe Line Co. and Tide Water Associated Oil Co. that it is due the stockholders of Prairie Oil & Gas Co. that the public be advised that an agreement between the Tide Water and the other companies is at the present time too difficult and too remote to warrant further discussion and delay. We are, however, hopeful of consummation in the near future of satisfactory arrangements for the consolidation of the two Prairie companies and Sinclair.

"The consolidation, if and when effected, could do more as a unit to help in the stabilization of the industry than either or all of the concerns are now able to do separately. So far as the stockholders are concerned, the relative interest of each has been preserved in the merger as nearly equitable as is possible for human minds to agree upon. The three units are so complementary to each other, moreover, that in my judgment the share that each stockholder will have in the new company will be worth more to him than that which he holds in the individual company in which he has invested."

Tide Water Associated Oil Co. and Sinclair Consolidated Oil Corp., in a joint statement issued here, said:

"In view of the publicity that has been given to the discussion of proposals for the merger of the Prairie Oil & Gas Co., Prairie Pipe Line Co., Sinclair Consolidated Oil Corp., and the Tide Water Associated Oil Co., the management of these companies feel that their stockholders and others interested should be advised that it has been found impossible at this time to agree upon mutually satisfactory terms for the inclusion of Tide Water Associated Oil Co. properties in such a merger. Negotiations to this end between the Tide Water Associated and the other interests concerned have, therefore been abandoned."

Northern and New York Transit

Due to the fact that available funds are considerably in excess of the requirements of its operations, there is a likelihood Northern Pipe Line Co. will take steps in the not distant future to make a further partial return of investment to stockholders through the declaration of a substantial cash dividend. The amount of this dividend probably would be applied against a reduction in the capital stock, the par value of which may also be reduced from the present $50. Another of the former Standard Oil pipe lines on which a distribution is not far distant is the New York Transit Co., which is in position to make a dividend payment out of security holdings of about $6 a share.

Northern Pipe's issued capital stock, the only capital obligation, amounts to $2,000,000, consisting of 40,000 shares. The original capital stock was $4,000,000 of $100 per value, which was reduced to its present amount in 1928 through the distribution of $50 a share in cash, representing a return of capital.

At the close of 1930 the Northern Pipe Line Co. holdings of United States Government bonds was $427,381 and other securities of $463,362, a total of $890,743, equal to more than $22 a share on the 40,000 shares of capital stock outstanding. In addition the company had cash of $234,328 and accounts receivable of $51,622 against liabilities of $92,748 in accounts payable and $9,432 reserved for taxes. Funds are set up against annuities and fire insurance reserves, while the depreciated value of plant is $1,045,404. Book value of the capital stock at the end of 1930 amounted to over $53 a share.

For 1930 net income was $110,512 after all deductions, equivalent to $2.76 a share, which compared with $140,017 or $3.50 a share in 1929. The company has a long record of dividends, $5 a share being paid in 1929 on the new $50 par stock, $4 in 1930 and $4 this year, of which 50 cents was out of nonrecurring income.

New York Transit Co. has outstanding $1,000,000 of capital stock, the only capital issue, consisting of 100,000 shares of $10 par value. The original capitalization of $5,000,000 of $100 par was reduced to the present amount in 1929 through the distribution of $62 a share as return of capital and exchange of two shares of $10 par stock for each of $100 par. Book value of the stock at the close of last year was over $12 a share, with holdings of United States Government bonds and other securities totaling $721,173, or more than $7 a share. Cash amounted to $117,108 and accounts receivable $65,691, against liabilities of $69,500 of accounts payable and $3,481 reserve for taxes.

Following the $62 capital distribution. New York Transit Co. paid 40 cents in dividends in 1929, $1.80 in 1930 and $1.15 for 1931, the dividend payable October 15 being 25 cents, including an extra payment of 10 cents.

Columbia Gas

Directors of the Columbia Gas & Electric Corp. declared a quarterly dividend of 37½ cents a share on the common stock, placing the stock on $1.50 annual dividend basis, as against the $2 basis which had previously prevailed.

During the past two years the revenues of the corporation have been unfavorably affected by depressed industrial and seasonal conditions. President Philip C. Gossler stated. However, these declines are being largely offset by operating economies which are not yet fully reflected in the earnings, he said. Under the most adverse conditions yet encountered the earnings per share of common stock have exceeded $1.50 on the number of shares now outstanding.

Chesebrough Extra

Chesebrough Manufacturing Co. has declared the regular quarterly dividend of $1 per share and the usual extra dividend of 50 cents, both payable September 30. Selling at 98½, Chesebrough broke 100 in Curbe Exchange trading last week for the first time since 1927, when a low of 76½ was recorded.

Stockholders of the Union Oil Co. of California on September 1 numbered 13,268, a new high record for the company and a gain of 1,724, or 14 per cent over the total of 11,544 on the books at the close of 1930, according to figures released by John McPeak, secretary of the company. For the 12 months ended September 1 the increase was 2,820 or 27 per cent.

During the first eight months of this year Union Associates gained 803 stockholders, or 15.7 per cent, the total being 5,910, while in the 12 months' period 1,137 stockholders were added for a 23.8 per cent gain. Stockholders of both companies aggregated 19,178, compared with 16,651 at the end of 1930 and 15,221 on September 1, 1930. Union Associates hold 2,498,051, or 56.9 per cent of the total 4,386,070 Union Oil shares outstanding.

Simms Petroleum

Stockholders of the Simms Petroleum Co. approved October 13 the purchase of not more than 100,000 shares of the company's own capital stock at an average price of $6 a share.

Burmah Oil

Burmah Oil Co., Ltd., has declared an interim dividend of 5 per cent on the common stock less tax against 10 per cent less tax last year.

Sinclair Consolidated

Sinclair Consolidated Oil Corp. declared the regular quarterly dividend of $2 on the 8 per cent preferred payable November 14 to stock of record October 31.

Penn-Mex Fuel

The Penn-Mex Fuel Co. declared a dividend of 50 cents, payable October 31 to stock of record October 24. A payment of 75 cents was made three months ago.

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

Feb. 11	27.76	June 17	19.23
Feb. 18	28.53	June 24	22.33
Feb. 25	29.33	July 1	22.32
Mar. 7	27.67	July 8	21.24
Mar. 11	26.53	July 15	19.79
Mar. 18	26.78	July 22	21.33
Mar. 25	26.85	July 29	20.68
Apr. 1	24.80	Aug. 5	20.89
Apr. 8	25.52	Aug. 12	21.00
Apr. 15	24.72	Aug. 19	24.25
Apr. 22	22.73	Aug. 26	23.26
Apr. 29	20.54	Sept. 2	22.30
May 6	20.74	Sept. 9	20.29
May 13	20.38	Sept. 16	18.30
May 20	19.25	Sept. 23	17.64
May 27	18.35	Sept. 30	15.83
June 3	18.00	Oct. 7	15.86
June 10	19.62	Oct. 14	16.43

Atlantic Refining

Atlantic Refining Co. and subsidiaries report for nine months ended September 30, 1931, net loss of approximately $2,-

(Continued on Page 103)

STANDARD OIL STOCKS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.
(Complete record week ending Oct. 10)

1931 High	1931 Low	Week ended Oct. 10 Sales	Week ended Oct. 10 High	Week ended Oct. 10 Low	Close Oct. 14	Stocks—	Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1	⅛	No sales	..	..	..	Atlantic Lobos	499,448	N.P.	....	5-28-30	..	..	..	..	1	⅛
16	6¼	50	7½	7½	..	Borne Scrymser	$1,000,000	$25	....	10-15-30	56½	44½	46½	25	25	11¼
56	39	200	39	39	..	Buckeye Pipe Line	$10,000,000	$50	$1Q	9-15-31	76	53	74½	55	69	39⅞
129½	95	No sales	..	..	..	Chesebrough Mfg.	$3,000,000	$25	$1Q‡	9-30-31	161	117	210	130	184⅞	104¼
3⅞	1⅝	8,500	2	1⅝	1⅝	Creole Petroleum	5,977,872	N.P.	....	.....	17½	9½	11¾	5⅝	7⅞	3
39	20⅝	200	23¾	22	..	Cumberland Pipe Line	$1,500,000	$50	50cQ	6-15-31	114	67	75¾	40	65¾	20¼
36	19	600	23	19	20⅛	Eureka Pipe Line	$5,000,000	$100	$1Q	8- 1-31	88	64⅛	70½	40	54¾	26
3	1	No sales	..	..	..	Galena Signal Oil	$16,000,000	$100	....	.....	13	4¼	6½	3	7	2½
72	47¾	11,400	51	47¾	47¾	Humble Oil & Refining	$74,103,300	$25	50cQ	10- 1-31	114¾	59½	128	74⅛	119	57¼
18¼	7⅜	31,100	10	7⅝	9⅛	Imperial Oil of Canada (new)	25,421,768	N.P.	12½cQ	6- 1-31	104	56¾	41	22	30	15
21⅛	5½	1,000	8	5½	8⅛	Indiana Pipe Line (new)	$3,000,000	$10	25cQ	8-15-31	91⅞	74⅞	41⅞	26	41	14½
15½	7⅝	46,600	10¼	8	8⅞	International Petroleum (new)	14,247,088	N.P.	25cQ	9-15-31	55	35	30⅜	15	24	11⅜
17½	8⅛	1,300	9¼	8⅛	..	National Transit	$6,362,500	$12.50	25cQ	9-15-31	32⅜	19⅜	25⅛	10⅛	22⅜	11½
14½	5⅞	2,800	9	6¼	..	New York Transit	$1,000,000	$10	25cQ	7-15-31	75	38½	17½	10	21⅜	10¼
34¼	20	350	29¾	24½	30	Northern Pipe Line	$2,000,000	$50	$2SA	7- 1-31	69	56½	63	41	54	26¼
15½	6	500	6⅝	6	..	Penn Mex Fuel	$10,000,000	$25	75c	6-24-31	84	28	44½	20	32	12
16⅞	3¼	3,600	16⅞	16⅜	..	Solar Refining	$4,000,000	$25	....	12-20-29	..	..	50	20	33	4⅞
23⅞	12	8,200	13⅛	12⅛	..	South Penn Oil	$30,000,000	$25	25cQ	9-30-31	71⅞	36¾	60¼	35⅛	45⅞	16⅛
17	9	100	9	9	9½	Southern Pipe Line	$1,000,000	$10	50cQ	9- 1-31	19	15	22½	13	20⅞	8⅜
42½	25	50	30	28	..	Southwest Pennsylvania Pipe Line	$1,750,000	$50	$1Q	7- 1-31	102	70	70	60	64	32
38½	15⅞	55,700	21¼	15⅞	18⅞	Standard Oil of Indiana	$348,175,000	$25	25cQ	9-15-31	95⅞	70⅞	63	45	59⅞	30
23⅝	13¼	9,400	16⅝	13¼	15½	Standard Oil of Kentucky	$25,654,516	$10	40cQ	9-30-31	179¾	122¼	467⅞	29	40½	18⅝
36½	16½	400	20	16½	..	Standard Oil of Nebraska	$4,649,225	$25	50cQ	9-21-31	54⅞	39⅞	50¼	40	48⅞	34⅝
62½	35	1,150	41¼	36	42	Standard Oil of Ohio	$14,000,000	$25	62½cQ	10- 1-31	134	71	129	60	108½	43¼
4½	2⅝	No sales	..	..	..	Swan-Finch Co.	$861,466	$25	....	1-15-29	23¼	16	18	10	10	4

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus 50 cents extra.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending Oct. 10)

1931 High	1931 Low	Week ended Oct. 10 Sales	Week ended Oct. 10 High	Week ended Oct. 10 Low	Close Oct. 14	Stocks		Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1¾	¼	2,300	½	⅜	..	American Maracaibo	(sh)	700,000	N.P.	....	.....	9½	3½	8⅝	1⅛	4½	½
16⅞	6¼	4,900	8¼	6¼	..	British American Oil Corp.		1,311,321	N.P.	20cQ	7- 2-31	55	32¾	62	7⅞	23	13⅜
2⅜	½	1,000	¾	⅝	½	Carib Syndicate		$131,250	25c	....	.....	4½	3⅞	4⅞	1	2¾	⅝
20¾	5¼	161,500	7⅞	5¼	7⅛	Cities Service	(sh)	24,290,359	N.P.	30cA§	10- 1-31	90⅞	54	68⅛	20	44¼	13
84¾	35⅝	2,700	51¾	35⅝	52¾	Cities Service pfd.	(sh)	1,500,000	N.P.	50cM	10- 1-31	103¼	94½	98¾	84	93⅞	78¼
½	⅛	2,200	⅜	⅛	..	Colombia Syndicate		$2,000,000	$1	....	.....	3¼	.76	2	½	¾	⅛
2¾	1⅜	100	1⅜	1⅜	..	Consolidated Royal		$5,527,875	$10	50cQ	10-25-31	8⅞	6¼	11⅛	2½	5⅞	2
⅝	⅛	No sales	..	..	⅛	Crown Central		.....	....	....	.....	..	..	..	..	..	..
5	2	300	2	2	2½	Darby Petroleum (new)		1,019,392	N.P.	....	10-15-30	33½	3¼	26	6½	21¾	4¼
6	1¾	3,800	2½	1¾	..	Derby Oil & Refining	(sh)	500,000	N.P.	....	.....	2¼	1	11	2	11	2
40⅛	25	No sales	..	..	..	Derby Oil & Refining pfd.		48,500	N.P.	....	.....	21⅛	7½	44	20¾	60	30
75½	38	15,300	50	38⅛	45	Gulf Oil Corp.	(sh)	4,504,921	$25	37½cQ	10- 1-31	165	101⅛	209	115	166⅞	58½
⅝	1/16	1,200	1/16	¼	1/16	Intercontinental Petroleum		$5,682,000	$5	....	.....	3⅜	1	2⅞	⅜	1¾	⅜
1⅞	½	200	½	½	..	Kirby Petroleum	(sh)	750,000	N.P.	....	.....	3	1¼	3⅝	1¼	3	⅞
1½	1/16	3,800	½	1/16	..	Leonard Oil & Development		$50,000,000	$25	....	.....	9⅜	5⅛	6⅛	1	4¾	½
6¾	2¾	No sales	..	..	..	Lion Oil & Refining	(sh)	250,000	N.P.	....	10-27-30	43⅞	20	38⅞	18	29	4⅞
25	7⅛	33,600	10½	7⅛	9⅜	Lone Star Gas	(sh)	5,000,000	N.P.	22cQ	9-30-31	69⅛	48½	67⅞	28	55⅞	19⅝
½	⅛	1,700	¼	⅛	1/16	Magdalena Syndicate	(sh)	850,000	$1	....	.....	1⅞	½	1¼	½	½	⅛
5	2⅝	200	4	3	..	Margay Oil Corp.		160,000	N.P.	....	7-10-30	48½	32	38½	14	16	3
4⅞	1½	200	2⅛	1⅞	..	Mexico-Ohio Oil Co.		500,000	N.P.	....	.....	8	2¾	6⅜	2¼	7½	1¾
½	⅛	No sales	..	..	..	Mountain & Gulf		$4,000,000	$1	....	4-15-31	1¾	.76	1½	½	¾	⅜
5⅞	2½	1,900	3⅝	2⅝	..	Mountain Producers		$1,682,182	$10	25cQ	7- 1-31	28⅞	19½	22⅞	7	12⅛	3¾
1½	½	600	½	½	..	New Bradford Oil		$1,095,291	$5	....	4-15-31	5⅝	4¼	5	2½	3½	1⅛
3	1	4,000	1⅛	1	1	New Mexico and Arizona		$1,000,000	$1	....	.....	11⅞	7⅛	9⅜	2¼	7¼	1½
3¼	1	500	1	1	..	North Central Texas	(sh)	400,000	N.P.	....	9- 2-30	14¼	8½	18½	6⅛	11¼	2⅛
½	⅛	2,400	1/16	⅛	..	Pandem	(sh)	489,875	N.P.	....	.....	6	2⅛	3½	½	2½	¼
2	⅜	1,300	¾	⅜	..	Pantapec Oil	(sh)	1,506,000	N.P.	....	.....	15⅝	8½	10½	1⅞	4⅜	⅞
3⅛	½	1,300	1⅛	1	..	Reiter-Foster	(sh)	388,584	N.P.	....	12- 2-29	12⅞	4⅛	8½	1⅛	5⅜	1
3	1	200	1½	1	..	Ryan Consolidated	(sh)	500,000	N.P.	....	.....	12	4⅛	11	2	8⅝	2
1⅜	¼	200	¼	¼	..	Salt Creek Consolidated	(sh)	1,286,300	$10	....	4- 1-31	7¼	5½	5⅞	1⅞	2½	½
7¾	3¾	3,200	4¾	3¾	..	Salt Creek Producers	(sh)	1,496,859	$10	25c	11- 2-31	35	23⅛	25⅞	9	15¼	5¼
5¼	¾	6,000	1⅛	⅞	1/16	Sunray Oil	(sh)	1,163,185	$5	....	4-15-31	..	..	12	5⅝	10	2
1⅞	⅜	6,900	½	⅜	..	Venezuelan Petroleum	(sh)	755,090	$5	....	2-15-30	9⅛	4¾	6½	1¾	4½	⅜
3½	1⅛	400	1½	1⅜	..	Woodley Petroleum		$500,000	$1	....	3-31-29	8¼	4⅞	9½	2	5	½
2¼	¼	2,500	¾	⅝	½	Y Oil & Gas		100,000	N.P.	....	.....	8⅜	2⅛	2⅞	½	2½	⅜

*Ex-dividend. †Unit of trading less than 100 shares. ‡Payable monthly and monthly stock dividend of one-half per cent. §Paid in lieu of regular cash dividend of 2 per cent.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending Oct. 10)

1931 High	1931 Low	Week ended Oct. 10 Sales	Week ended Oct. 10 High	Week ended Oct. 10 Low	Close Oct. 14	Stocks		Outstanding capital	Par value	Div. rate	Last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
23	13	5,400	16	13	14	Amerada Corp.	(sh)	922,075	N.P.	50cQ	7-31-31	43⅞	27½	42⅝	17½	31½	16½
12⅜	2⅜	1,100	5	2⅜	3¼	American Republics Corp.	(sh)	209,180	N.P.	....	12-31-30	85	51⅛	64¾	12½	37	5⅛
31	9¼	70	10¾	9¼	..	Associated Oil		$57,260,300	$25	35c	6-30-31	53⅜	37½	47¼	34½	51	30
23⅝	9½	28,100	13	9½	11	Atlantic Refining		$66,763,775	$25	25cQ	9-15-31	66⅜	50	77⅞	30	51⅜	16⅝
14½	4¾	36,200	6⅛	4¾	5⅞	Barnsdall Corp. A		$56,546,600	$25	....	5-11-31	54	20	49⅛	20	34	8⅝
12	5	48 000	7¼	5⅜	6⅛	Continental Oil of Delaware	(sh)	4,741,554	N.P.	....	12-15-27	..	..	47⅞	18	30½	7¾
47	9⅝	16,400	15	9¾	12	General Asphalt	(sh)	413,333	N.P.	50cQ	9-15-31	94⅞	68	94¾	42¼	71½	22⅜
68½	19	18,100	31⅞	19	24½	Houston Oil		$24,968,600	$100	....	10-17-30	167	79	109	26	116⅞	29¼
4⅝	1⅝	1,400	2½	1⅞	..	Indian Refining		$12,564,070	$10	....	10- 1-30	39⅝	9	53	13⅛	17	2
4½	1⅜	2,200	1⅝	1⅜	..	Louisiana Oil Refining	(sh)	1,190,063	N.P.	....	.....	19¾	9⅜	18	7	12	3½
3⅜	½	600	1	⅝	..	Maracaibo Oil	(sh)	330,000	N.P.	....	.....	25½	12½	18½	5⅛	10⅜	1⅜
16⅜	5	18,200	7½	5	6¼	Mid-Continent Petroleum	(sh)	1,857,912	N.P.	....	2-16-31	44½	25⅛	39⅞	22⅛	32	11
19½	6½	28,300	8⅞	6⅝	7¼	Ohio Oil	(sh)	6,648,052	N.P.	....	3-14-31	84	58½	79⅞	64¼	32	16
35⅛	20	300	20	20	..	Pan American P. & T.		$50,084,700	$50	40c	7-20-31	50⅞	38¼	69	40½	46½	42
36½	20	200	20⅛	20	22	Pan American P. & T. "B"		$121,110,650	$50	40c	7-20-31	59⅞	37¾	69¼	40½	67¼	30
4¼	¾	600	1	¾	..	Panhandle P. & R.	(sh)	199,370	N.P.	....	.....	21¾	11½	15¼	3	12¾	1¾
20⅛	9½	50	10⅛	9½	..	Panhandle P. & R. pfd.		$2,564,400	$100	....	.....	108	70	76	47½	20	47½
16⅝	4¾	27,700	6¾	5	5⅝	Phillips Petroleum	(sh)	2.593.075	N.P.	....	1- 2-31	53⅞	35¼	47	24¼	44⅜	11½
1½	½	6,300	½	½	..	Pierce Oil Corp.		$29,622,831	$25	....	.....	5¼	½	3⅜	1	2½	½
3⅜	⅞	20,800	1⅜	⅞	..	Pierce Petroleum	(sh)	2,500,000	N.P.	....	2-16-31	7	3½	5⅞	½	7⅛	1⅜
20⅜	5½	9,500	8⅜	5½	6½	Prairie Oil & Gas		$60,848,000	$25	....	3-31-31	68	46	65⅜	40½	54	11¼
26½	7⅝	34,400	10	7⅝	8¼	Prairie Pipe Line		$101,250,000	$25	....	6-30-31	280	172	65	45	60	16⅜
6	1½	1,400	2	1½	1⅝	Producers & Refiners		$37,438,950	$50	....	9-15-23	29⅞	16	25⅞	4	11⅞	1
16	5¾	80	6	5¾	..	Producers & Refiners pfd.		$2,845,350	$50	....	5- 4-25	49⅝	41	46¾	25½	40	11½
11⅞	5	22,600	6½	5	5⅝	Pure Oil		$75,959,250	$25	....	9- 1-30	31⅝	19	30¾	20	27¼	7⅝
6⅜	⅞	1,400	1	⅞	1	Richfield Oil (new)		$52,410,875	N.P.	....	.....	56	23	49⅝	20	9¾	4⅛
10¼	2⅛	4.000*	3⅛	2¼	2¾	Rio Grande Oil	(sh)	1,236,270	N.P.	....	7-25-30	37½	32	42½	15	25¾	5
42⅝	13½	9,900	19¾	16⅜	18	Royal Dutch N. Y.	(sh)	611,303	....	$0.938	8- 4-31	64	44⅝	64	43⅛	56½	36⅞
20¾	5½	38,700	8⅞	5½	7½	Seaboard Oil of Delaware (Mex. Seab.)	(sh)	1,244,383	N.P.	....	10- 1-24	72	4⅝	59⅜	8¼	37	9¾
34	9¾	130	10	9¾	..	Shell Transport & Trading Co.		£23,985,000	£1	$0.966	7- 6-31	47⅞	41⅜	51½	40⅝	48⅜	26
10¼	3¼	26.800	5	3½	3⅞	Shell Union Oil	(sh)	13,066,497	N.P.	....	6-30-30	39¼	23¼	31¾	19	25½	5¼
11	4¾	4,700	6	5	5	Simms Petroleum		$8,353,620	$20	....	9-15-30	27½	18⅛	40⅛	15	37	5⅝
15⅞	5½	89,300	7⅞	5½	6½	Sinclair Consolidated	(sh)	5,500,000	N.P.	....	4-15-31	46¾	17⅜	45	21	32	9¾
103	77	900	84⅛	80	..	Sinclair Consolidated pfd.		$16,025,250	$100	$2Q	8-15-31	110	102½	111	103	112¼	86
12⅞	3⅛	1,500	5⅛	3¾	4¾	Skelly Oil		$27,441,250	$25	....	12-15-30	42⅝	25	40½	28	12	10⅛
21	12⅛	91,700	15⅜	12⅛	13⅞	Socony-Vacuum	(sh)	31.923.072	$25	40cQ	9-15-31	..	..	..	..	..	..
51¾	28⅛	57,600	33⅝	28⅛	30½	Standard of California	(sh)	12.594.098	N.P.	62½cQ	9-15-31	80	63	81⅞	51½	75	42½
19	8¼	3,400	10½	8½	10	Standard of Kansas		$8,000,000	$25	....	3-16-31	37¾	15	33¾	18	49	14⅜
52½	28¼	159.400	33⅞	28¼	30	Standard Oil of New Jersey		$634,999,200	$25	25cQ§	9-15-31	59⅜	37¾	83	49	84⅞	32½
45¼	26¾	9,900	35¾	31⅛	..	Sun Oil	(sh)	1,416,869	N.P.	25cQ	9-15-31	77	31½	68⅜	55	70	39
1¾	½	500	⅝	½	½	Superior Oil Corp.	(sh)	766,979	N.P.	....	12-20-30	..	..	24	5¼	9⅜	¾
36¼	15	59,100	19½	15	17½	The Texas Corporation		$246,204,900	$25	50cQ	10- 1-31	74¾	50	71⅞	50	60½	28¼
6½	2½	5,900	4⅛	2½	..	Texas Pacific Coal & Oil Co.		$9,304,890	$10	....	12-31-29	26⅝	12⅛	23⅞	9½	14½	4
18	10½	No sales	..	..	..	Tide Water Oil	(sh)	2,191,759	N.P.	15cQ	6-30-31	41½	19⅝	40	14	31	13
83	35	900	40	35	35½	Tide Water Oil pfd.	(sh)	19.947.000	N.P.	$1.25Q	8-15-31	100⅛	86	97½	85⅛	94⅞	71
9	3½	31,700	4⅛	3½	3¾	Tide Water Associated	(sh)	5,560,424	N.P.	....	2-16-31	25	14¾	23½	10	17¾	5⅞
68	20½	3.300	27	21¾	27	Tide Water Associated pfd.		$73,284.500	....	$1.50Q	10- 1-31	..	..	90⅞	74⅛	89¾	55
26⅝	11¾	15,800	16¼	12¼	14¾	Union Oil of California		$104,342,375	$25	50cQ	8-10-31	58	42⅜	57	42⅛	50	10⅛
25¼	18½	3,500	19	18½	19	Union Tank Car	(sh)	1,254,048	$100	40cQ	9- 1-31	128⅛	110	163¾	121⅞	38½	23
7⅜	1	2,500	1¾	1⅜	1½	Warner-Quinlan	(sh)	632.948	N.P.	....	7- 1-30	44⅞	26	42⅞	15	27	4¼
9⅜	3	500	3¾	3½	3¾	Wilcox Oil & Gas	(sh)	428,907	N.P.	....	5-10-28	..	..	29¾	12⅞	21	6½

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus extra dividend of 25 cents.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been stock split-ups.

Readjustments of Pipe Line Rates Brings Cut To Bradford-Allegany

BRADFORD, Pa., Oct. 17.—Bradford and Allegany districts received a cut of 10 cents in the price structure of their crudes on October 15, bringing the price of Bradford and Allegany crude to $2.15 per barrel.

Owing to the decreased pipe line rates in the districts south of Bradford, the differential between delivered Bradford crude and crude delivered from the southern district was excessive, oil men said. As a result, either an increase in the price structure of the southern crudes must be made, or a reduction in the price of Bradford and Allegany crude. A softening in the prices of gasoline, fuel oil, and bright stocks did not permit an increase in the southern district crudes, and, consequently, necessitated the elimination of a too great differential between northern and southern districts by a reduction in the Bradford and Allegany districts.

The trunk line rates to Pittsburgh, Franklin, Oil City, Warren and Titusville areas were decreased 3 to 5¾ cents per barrel by the Buckeye Pipe Line Co. on September 8. An increase in the price structure of Buckeye crude was made effective the same day. The increase amounted to 5 cents and was made possible by the position of the refined market at that time.

The action of the Buckeye Pipe Line Co., transporters of crude in southeastern Ohio, was followed on September 15 by the Eureka Pipe Line Co. which reduced its pipe line rates a similar amount. These reduced pipe line rates by the Eureka Pipe Line Co., gatherers of crude in West Virginia, pertained to crude delivered to the Pittsburgh, Franklin, Oil City, Warren and Titusville areas. A 15-cent advance in all Pennsylvania grade districts was made on September 12, causing a differential of 15¼ cents between Bradford crude delivered at Oil City and southern grades.

Another Reduction

Effective October 15 there was a further reduction of 5 cents in gathering rates which resulted in a reduction of 5 cents in the delivered cost of southern grades to the various districts. This decrease brought about a differential of 20¼ cents per barrel between delivered northern crude and delivered southern crude. A differential so great could not, under present conditions, be maintained and resulted in a decrease of Bradford and Allegany crude.

The decrease ends the steady advancement of the price structure of Pennsylvania grade which began July 29. Since that time Pennsylvania grade crude has advanced 65 cents per barrel. The advancement on July 29 amounted to 20 cents and was followed by a 15-cent increase on August 3; a 5-cent increase on August 17; a 10-cent increase on August 29; and a 15-cent increase on September 12. Previous to the advancement on July 29, Bradford crude was at the low level of $1.60 per barrel, having shown a steady decline since October, 1930, when the price of oil was $2.55 per barrel.

UNION GIVEN CONTRACT

LOS ANGELES, Calif., Oct. 19.—Union Oil Co. of California has closed a five-year contract with the Nicaraguan government to supply the republic's entire requirements of refined and lubricating oils.

The government's requirements of gasoline, kerosene and lubricating oils for the first year are estimated at 3,000,000 gallons.

Storage facilities for gasoline are already in the process of construction at Corinto, a harbor on the northwest coast of the Central American republic. The first deliveries under the contract are expected to be made about the first of the year.

NEW WELL INDICATES SAXET FIELD SIMILAR IN SOME WAYS TO REFUGIO

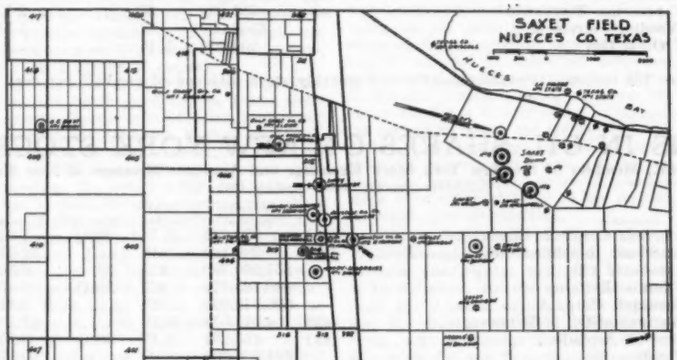
By B. D. Stevenson

SAN ANTONIO, Tex., Oct. 17.—Neal, Milton & Kepley Production Co.'s No. 1 Roark in the Saxet Field in Nueces County that showed up so well on a drill stem test in a deep sand not producing in any other test in the field seems to help bear out the theory that the Saxet Field will be similar in some ways to the Refugio Field.

The location of the new well with relation to other tests in the field and also some completions made since a map of the field was published in the Oil and Gas Journal of May 14, 1931, Page 57, is shown on the map herewith.

The Saxet Field is described as a broad anticlinal fold analagous to the Refugio Field and like the Refugio Field the first completions were gas wells which it later developed were in the west side of the field. As drilling progressed to the east, oil was found though there were some oil showings in many of the gas wells. The axis of the field takes nearly a north and south direction as shown by the hypothetical lines in the Duessen map in a government report (Professional Paper No. 126).

There is a flattening out toward the west and the developed part of the field is about 5 miles long east and west but the axis of the anticline is a little east of north. A little below F. P. Zock's No. 1 Kelley, which is not shown on the accompanying map but which is a little over 2 miles south of F. P. Zock's No. 1 Baldwin, the contour lines swing to the west for a distance and then to the south again.



One of the features of the field is the showing of oil that was had in the Independent Oil & Gas Co.'s No. 1 Baldwin, shown in the southeast corner of the map in a sand that correlates with the 4,832-foot sand in the No. 1 Roark. It failed to make a well but in the light of the showing in the No. 1 Roark it would look as though the No. 1 Baldwin was a little too far to the east and in the extreme edge of the field.

There are only three other tests in the field that went to or below 4,800 feet and they are to the west, two of them quite a distance to the west. The nearest is the Houston Oil Co.'s No. 2 Rand Morgan which was drilled to 6,375 feet. It had a sand at 4,819 feet which was tested but failed to make a well.

On the accompanying map the tests producing at around 4,037 to 4,097 feet are enclosed in circles. These wells are all gas wells but making a little oil. Three wells of the Saxet Oil Co. which were drilled to around 4,300 feet and which made some oil with gas are enclosed in double circle and the tests which were drilled to below 4,800 feet are indicated by short arrows and the Roark well with a longer and larger arrow.

Zock's No. 1 Kelley, 2 miles south of the F. P. Zock's No. 1 Baldwin and not shown on the map was drilled only to 3,008 feet, hence the deeper horizon in that territory is all untested. Other tests shown on the map as producers are producing from sands at around 2,300 to 2,500 feet with the exception of the Houston Oil Co.'s No. 1 Rand Morgan which is a gas well of about 20,000,000 feet at total depth of 1,670 feet.

The Saxet Field has already been shown to be a field of many sands. The Houston Oil Co.'s No. 1 Rand Morgan is the only test completed in sand at 1,670 feet though the company's No. 2 Harrell was originally completed at that depth. L. L. Smith's No. 1 Hunter is a 25,000,000-foot gas well at 3,368 feet, the only test thus far completed in that sand and the Gulf Coast Oil Co.'s No. 1 Harrell first completed at 4,087 feet was afterward deepened and is now a producer at 4,553 feet, the only producer in that sand. The Houston Oil Co.'s No. 2 Harrell blew out at 2,725-40 feet and ran wild for a time giving evidence of a sand there.

In addition there are eight wells which produced in sand at 4,037 to 4,097 feet, three at about 4,300 feet and three producing gas sands, one at about 2,325 feet, one at about 2,425 feet and one at about 2,560 feet.

This gives the field a total of nine known sands and the deepest hole thus far drilled is the Independent Oil & Gas Co.'s No. 1 Baldwin on the east edge of the area that went to a total of 6,140 feet.

Pearson's No. 1 State, shown in the lower part of the map, went only to less than 2,500 feet. The Texas Company's No. 1 Driscoll shown in the north edge of the map was an interesting test. It was drilled several years ago and stopped at 4,600 feet and most of the drilling was in shale.

La Prade's No. 1 State out in the bay is producing at 2,653 feet and The Texas Company drilled its No. 1 State in the bay as an east offset and missed the pay and drilled to a total of 4,141 feet and abandoned it. At 2,527 feet The Texas Company's No. 1 State tested dry.

On drill stem test Kepley's No. 1 Roark flowed in 15 minutes and has set casing.

ARGENTINE CRUDES ALL FAVOR CRACKING

(Continued from Page 22)

ous cracking and coking, or nonresiduum method. The cracking stock consisted of 92.9 per cent fuel oil and 7.1 per cent gas oil. Its gravity was 22.9° A.P.I., 7 per cent distilled over at 572° F., and the flashpoint was 194° F.

Tests were carried out at about 200 pounds pressure and 895° F. yielding 57.9 per cent of 437° F. endpoint gasoline; a pressure distillate bottoms which is useful as Diesel or tractor fuel; and coke and gas. A summary of the yields of products is shown in the table.

Summary of Cracked Products

Pressure dist. (pct. charge)	76.2
Gasoline (pct. charge)	57.9
A.P.I. gravity	60.0
Init. b.p., °F.	89
Endpoint, °F. 437	
Diesel fuel (pct. charge)...	14.4
Dist. loss (pct. charge) ...	3.3
Coke, gas and loss (pct. charge)	*23.8
Coke, lbs. per bbl. raw oil .100	

*Includes residuum 3.9 per cent.

Pressure Distillate

The pressure distillate obtained from cracking the above Comodoro oil represented 76.2 per cent of the charge. It analyzed as follows:

A.P.I. gravity	55.6
Initial B.P., °F.	89

A.S.T.M. 100 c.c. Distillation

Per cent Distilled over	Temp. °F.
10	149
20	205
30	255
40	293
50	329
60	374
70	410
80	457
Endpoint	500
Per cent over at 410° F.	70
Per cent over at 437° F.	76

Cracked Gasoline

This pressure distillate may be treated by the following simple process:

1. Agitate with 3 to 5 pounds of 66° Baume sulphuric acid per barrel of distillate; settle and draw off the sludge.
2. Wash well with water.
3. Neutralize with about 1.5 per cent by volume of 16° Baume sodium plumbite solution; settle and draw off the sludge.
4. Distill with fire and steam at a maximum still temperature compatible with the capacity of the equipment, and color stability of the finished gasoline.
5. It is desirable to wash the freshly distilled gasoline with about 1 per cent by volume of 1 to 2° Baume caustic soda solution to remove any hydrogen sulphide and to improve the odor.

Treatment and distillation of the pressure distillate yielded a cracked gasoline of 60° A.P.I. gravity, and pressure distillate bottoms. The gasoline distilled as follows:

Initial B.P., °F.	89

Per cent Distilled over	Temp. F.
10	156
50	259
90	354
Endpoint	437

Refineries in Argentina

There are 15 refineries in Argentina, three of which are under government control.

One refinery, under construction at Buenos Aires, will have a capacity of 3,500 bbls. per day, and another new refinery in that city will have a daily capacity of 1,000 bbls.

The accompanying table shows available data on the petroleum refineries in Argentina as presented by the U. S. Bureau of Foreign and Domestic Commerce in its Trade Information Bulletin No. 723.

UNFAVORABLE REPORTS ON IMPORTANT TESTS

CORNING, N. Y., Oct. 17.—The Penn United Gas Co.'s No. 1 Boom, one of the most interesting tests in the Tioga County, Pennsylvania, gas field looked unfavorable at last report. The Oriskany sand had been penetrated 3 feet at a total depth of 4,090 feet with no showing of gas. The test is in Lawrence Township and not far from gas wells.

Another interesting test is the York Penn Gas Co.'s No. 1 Dickinson near the city of Troy, Bradford County, which lies east of Tioga County. This well was drilling at 3,814 feet.

A number of new locations in the Pennsylvania side of the New York-Penn-

sylvania gas field have been reported in the past week.

The Elmira Natural Gas Co.'s wildcat, No. 1 Berthod, being drilled on a location near Elmira, Chemung County, is 12 feet in the Oriskany sand with nothing showing.

A number of wells in the Wayne area reported two weeks ago as close to the top of the sand stopped drilling when the top of the Oriskany pay was reached and may not be drilled in until the need for the gas is evident.

H. D. Gray, 46, a driller employed on No. 1 Croft, Universal Oil & Gas Co.'s well in Lawrence Township, south of Nelson, Pa., was fatally injured when the bull ropes broke while Gray was at work on the rig. He died in Blossburg, Pa., Hospital.

MARTIAL LAW NEEDED IN EAST TEXAS AREA

(Continued from Page 14)

natural gas producers in the East Texas oil field in said counties are still in existence and still threaten and constitute a state of insurrection against the conservation laws of the State, as more fully set out in said original proclamation; and

Whereas, according to facts presented to me by reliable persons it is evident that said organized and entrenched groups of crude petroleum oil and natural gas producers in said East Texas oil fields are threatening and planning to openly violate the conservation laws of the State, and threaten by violence, if necessary, to create and carry on a waste of crude and petroleum oil and natural gas and to continue in open rebellion against the efforts of the constituted civil authorities of this State to enforce such orders and the conservation laws of this State;

Now, therefore, you are hereby commanded to issue and promulgate as the orders of the governor of Texas and commander-in-chief of the military forces of this State, an order allowing not exceeding 165 bbls. of crude petroleum to be produced per day from any well in the military zone as defined in said original Proclamation No. 9447, and to put same into full effect as the military orders of your command until otherwise ordered.

The original Proclamation No. 8447, dated August 16, 1931, is hereby continued in full force and effect, subject to this order.

Governor Sure of Case

The power to interfere with or suspend martial law over the will of a governor lies in the United States Supreme Court or the President, Governor Sterling declared.

"I am perfectly sure of the legal status of the case. The same question was raised once in regard to martial law at Galveston. A Federal Court issued a restraining order, which was held to be without effect," the governor said. "Common sense indicates that martial law can not be set aside in that way. The essence of martial law is that it is declared because civil processes have broken down. If a district judge can enjoin it martial law is useless."

One of the first effects of the order was a transfer of jurisdiction of possible violation of proration regulations from the civil officers of the railroad commission to a military tribunal. This followed the issuance from military headquarters of Special Order 48, appointing a board of inquiry, composed of military officers, to inquire into violation of any proration order. Its function is similar to that of a grand jury. Should a case arise where it finds trial necessary, the military procedure is to appoint a special court composed of military officers to try the case under military law. Maj. C. E. Parker was named president of the court. Other members are Capts. C. K. Davis and McCord McIntyre. Repsentative of the provost marshal, Col. L. S. Davidson, or A. B. Capers, deputy supervisor in charge of proration in East Texas, are empowered by the order to sit with the board and interrogate witnesses.

The provost marshal is directed to issue a summons or attachment, or summons duces tecum, requiring any designated person to appear or produce before the board at a time fixed by it, or forthwith, any books, records or papers for examination by the board.

General Wolters' Statement

Turning the East Texas oil field loose again to destructive production would goad citizens of this section to an uprising and a resort to armed force to shut the field, Brig. Gen. Jacob F. Wolters, martial law commander of the area, said here Friday after a conference with Governor Sterling on the order of a federal court to release some of the wells from state and martial law restrictions.

He made no direct reference to Federal Judge Randolph Bryant's order to open five wells from 165 to 5,000 bbls. daily apiece. Judge Randolph has indicated no further steps will be taken until a federal court hears the case on this temporary order at Beaumont, October 29.

General Wolters' statement said:

"It is evident that the people of Texas have never fully understood the real situation in the East Texas oil field. The military forces did not arrive one day too soon to prevent outraged land and royalty owners from taking possession of the field and by force of arms shutting down the wells that were running wide open. The operation of the oil field in an orderly manner and under proration since that time has convinced not only the royalty and land owners, but 95 per cent of the independent operators that to again permit the wells to run wide open would result in the destruction of their oil resources and irreparably injure and damage them, as well as impose a very great loss to the State of Texas and its revenues.

Alarming Talk

"I do not hesitate to say that if the wells are again opened wide the landowners, royalty owners and a large majority of the independent operators, probably joined by many other citizens, would likely undertake by force of arms to shut down the wells. The talk is more or less openly made that if the wells cannot be held down by the State of Texas, that they will be shut in by citizens, and if this cannot be done by reason of guards around them, the pipe lines and storage tanks will be blown up so that there will be no place to put the oil, and therefore by that means force a shut down.

"On August 7 when the military forces took charge of the field oil was selling at 10 cents a barrel, less the gathering charge of 5 cents. In other words, from 10 to 5 cents. Today oil is selling for not less than 68 cents in the East Texas Field. The imposition of martial law has saved not only the landowners and the operators, but is bringing into the State treasury approximately $3,500 per day from the production tax alone, and the royalty owners are now being paid their royalties.

"I shall not enter into a controversy with anyone as to these facts. I do say to the people of Texas that if and when it becomes proper before any judicial or legislative tribunal, I would support my statement with the testimony of innumerable citizens residing in the district."

CAM BLOOM DRILLED TWO FAMOUS WELLS

(Continued from Page 15)

All but the last covered wagon had been conveyed safely to the south bank in this manner when disaster fell.

The team which had been detached from the next to the last covered wagon was waiting to be taken across without a load, like those preceding it, when the owner of the one wagon still remaining on the north bank was seized with a bright idea. He hitched the idle team to the tongue of his own wagon and thus, with a four-horse team, started to ford the river. Cam shouted a warning, but his words were unheeded. Near the middle of the stream the horses began to flounder. One was drowned. The oilfield workers went to the rescue and unhitching the three other horses, managed to save them. They then hitched a six-horse team to the wagon and got it across, with its crestfallen owner and his terrified wife and children.

That evening Cam, though disgusted over the interruption of his work by what had occurred at the Arkansas, went to Tulsa and entered a store where a group of men were chatting. He explained the plight of the family in the covered wagon. "They've got to have a horse," he said in conclusion. "I'll buy half a horse if the men of this town will buy the other half."

"That's fair," responded one of the men after a moment's silence. "If a stranger is willing to do that alone we ain't worth a damn if we won't do as much all together."

A horse forthwith was bought for $60 from a near-by farmer.

"Now that family's got to have something to eat," announced Cam. "Here's $5. You fellows put up five more."

It was done. When the horse and the $10 were delivered to the stranded family the woman wept for joy. Before she could throw her arms around his neck and kiss him Cam got away in the darkness.

Organize Gas Company

Cam and his partner became leading figures in the oil and gas development of the Mid-Continent area. In 1893, with J. D. Nickerson, an experienced driller from the East, they organized the Independence Gas Co., capitalized at $50,000, to supply the city of Independence, Kans., with gas. On the strength of a 3,000,000-foot well brought in on the Brewster farm, east of town, shortly before the organization of the company a franchise was obtained from the city and the necessary lines were laid. But further drilling for gas met disappointment. There was a succession of dry holes on the Brewster, Waggoner, Cutlett, Dudgeon, Overfield, Dreer, Taft and Duncan farms.

The winter of 1894-5 was a dismal one for the Independence Gas Co. Its promoters had a contract to supply gas, but where were they to get the gas? They shipped in coal by the carload and delivered it to their customers, charging gas rates for it. This only sent them more deeply into their financial hole. The winter was cold, the gas supply outrageously low and the line damp. Mr. Bloom, who at this juncture was boarding on the Brewster farm, arose from bed night after night shortly after 12 o'clock and walked the line to town, building brush fires at the "swags," or low places, in the line to thaw out the ice so that folk in Independence, relying on the company, might at least have what little gas there was in getting breakfast.

Things were at their blackest and the relations between the company and the three Independence banks were strained when a well which the company was drilling on the Greer farm on the west side of the town came in with a roar and registered 5,000,000 feet of gas. That well turned the tide. A telegram to St. Louis brought pipe, and a new line to Independence was laid. Other producing wells followed and the sun shone once more.

Mr. Bloom and Mr. McBride bought out other interests in the Independence Gas Co. until they owned 70 per cent of its stock. Later R. M. Snyder, head of the New York Oil & Gas Co. and an early operator in Montgomery County, Kansas, paid McBride & Bloom $550,000 for their holdings and organized the Kansas Natural Gas Co., now a Henry L. Doherty & Co. subsidiary.

Race for Leases

The boom which resulted in the rush to Kansas in 1903-4 saw Mr. Bloom in the thick of the excitement. After a 15,000,000-foot gasser had been brought in by the Kansas Natural near Bolton there was a race for leases, in which Mr. Bloom and his partner led. They had more than 75,000 acres of land in Montgomery County under lease. Then came the opening of the Bolton Pool and in its development Mr. Bloom was one of the active operators. He and Mr. McBride were also pioneers in oil and gas operations in the Caney, Kans., district, where later some of the best gas wells in the state were found.

The McBride & Bloom partnership was dissolved in 1908. Mr. Bloom continued in the contract drilling business, but with the passing of the years he devoted less and less time to this and he disposed of most of his oil and gas interests, eventually confining his attention almost exclusively to difficult fishing jobs and to remedying the sundry troubles that beset oil and gas wells.

One of Cam's early employments in the oil and gas development of eastern Kansas has not been mentioned. It was that of well shooter for the Paola Gas Co. Nitroglycerin was brought in 10-quart cans from Joplin, Mo., where it was used in lead and zinc mining. Cam had none of the modern safety devices for transporting the explosive. The cans were packed in sawdust in the bed of an ordinary wagon and driven from Joplin to a secluded woods on a farm near Paola, where they were buried in the ground, necessary arrangements having been made with the owner of the farm. Sometimes there would be 100 quarts of the stuff secreted thus. A fence built around the cache kept curious cattle out of danger. Only the owner of the ground and a few persons connected with the Paola Gas Co. knew about this concealed agglomeration of death and desolation.

Against the Law, But——

One day Cam, driving a one-horse buggy, was taking a 10-quart can of the nitroglycerin from its hiding place, on the east side of Paola, to shoot a well on the west side of the town. The can, in a box padded with sawdust, nestled between his knees. To drive through Paola with the explosive would be a vio-

OIL MAN'S CALENDAR

OCTOBER

27-29—Washington, D. C., S.A.E. National Transportation and Maintenance Committee, Shoreham Hotel.

29-30—Kansas City, Big Four State Oil Jobbers Association, Hotel President.

29-30—Roanoke, Va., Virginia Oil Men's Association, Patrick Henry Hotel.

NOVEMBER

10-12—Chicago, Twelfth Annual Meeting, American Petroleum Institute, Stevens Hotel.

16-21—Pittsburgh, Pa., Third International Conference on Bituminous Coal, Carnegie Institute.

30-Dec. 4—New York, Annual Meeting, American Society of Mechanical Engineers.

DECEMBER

2-3—Indianapolis, Ind., Indiana Petroleum Association, Hotel Severin.

7-12—Atlantic City, N. J., Trade Show, Motor and Equipment—National Standard Parts Associations.

9-11—Atlantic City, N. J., American Institute of Chemical Engineers.

9-11—Omaha, Neb., Nebraska Petroleum Marketers, Hotel Paxton.

28-31—Tulsa, Okla., Geological Society of America, Mayo Hotel.

1932

JANUARY

9-15—Detroit, Mich., Convention and Road Show, American Road Builders' Association, Airport Building.

9-16—New York, National Automobile Show.

11-12—Fargo, N. D., North Dakota Division, Northwest Petroleum Association, Waldorf Hotel.

14-15—Minneapolis, Minn., Minnesota Division, Northwest Petroleum Association, Radisson Hotel.

30-Feb. 6—Chicago, Ill., National Automobile Show.

MARCH

17-19—Oklahoma City, Okla., American Association of Petroleum Geologists.

APRIL

11-16—Boston, Mass., Ninth Annual Convention, American Oil Burner Association.

lation of a city ordinance, and Cam knew it. But he knew too that if he didn't do it he would have to make a detour of about 10 miles. He disliked breaking the law, but he disliked the detour worse.

Cam was driving warily through the business district of Paola when a moist spot on the floor of the buggy, right at the edge of the box, caught his eye. He drew in the reins and said "Whoa!" Cautiously drawing alongside the curb and investigating, he found that his sickening suspicion was correct. The can between his knees had sprung a leak and the nitroglycerin, oozing through the sawdust and out of the wooden box, was dripping through a crack in the buggy floor. Some of it had trickled down onto the "fifth wheel" under the floor, and the movements of this mechanism were likely at any instant to set off an explosion that would——

The leaden feeling in Cam's stomach became positively painful as a picture of Paola—and of himself—after the cataclysm flashed across his vision. Pulling himself together he resolved to try to reach the company's office in Paola and get a fresh can into which he might pour the nitroglycerin. Trying to appear casual and failing miserably, he addressed a young man on the sidewalk:

"I wonder if you'd hold my horse for a few minutes while I run over to the gas company's office?"

(That 10 quarts of destruction was less likely to go off if somebody held the horse, Cam told himself by way of quieting his conscience. Besides, if it went off at all it would kill the young man anyway. What difference could it make whether he happened to be holding a horse, lighting his pipe or skinning a banana?)

But He Didn't Care to Hold the Horse

The young man eyed him suspiciously and asked, "You got some of that nitroglycerin in there?"

"Yes, I have," confessed Cam, who had no desire to be blown into eternity with an untruth on his lips. "You see, I——"

No use. The young man was becoming a speck in the distance. Cam was wiping drops of sweat from his forehead when a policeman, evidently notified by the terrified young man, appeared.

"What are you doing?" the officer inquired.

"Well," replied Cam, "I guess I'm on my last load of nitroglycerin. Got a leak. I know it's against the law, and I'm ready to turn the whole outfit over to you."

"I don't want it," was the quick and emphatic response. "You get that stuff out of town and get it out quick."

"All right," returned Cam in a voice that meant "You'll be to blame for what happens now." First he gingerly turned the can upside down, so that the leak was at the top instead of the bottom. Then he said "Giddap!" as well as he could from a dry throat and started off, wondering whether they would find enough of him to justify hiring an undertaker.

But nothing happened, and with the passing of the minutes each revolution of the buggy wheels revived Cam's hopes. He drove to the well, shot it and then went to the company's office, where he found I. N. Boicourt, manager, nervously pacing the floor.

"I never was so glad to see anybody in my life!" exclaimed Mr. Boicourt.

"Huh!" snorted Cam. "You don't know what gladness is."

In telling of his experience later Cam said: "I made a solemn pledge to my creator that if he would let me get out of that scrape I never would haul another drop of nitroglycerin." He kept that pledge.

A.G.A. ENDORSES THE FIVE-YEAR PLAN

(Continued from Page 17)

dustry in pioneering the newer uses of gas, Mr. Paige said: "I would like to review for you the advancement of the house heating business. In 1922, comparatively few gas sales executives were paying much attention to this class of our sales, campaigns for house heating with gas as fuel were being undertaken by only a few companies, and special rates for house heating were rare. The effective expansion of house heating was brought about only by the gathering of technical data underlying house heating requirements, the establishment of uniform sales and servicing policies, and the adoption of special rates. During the year 1930 the manufactured gas industry sold over 25,000,000,000 feet of gas for house heating purposes. In 1925 the sale of gas for this purpose approximated only 6,000,000,000 feet, showing a gain in a five-year period of over 300 per cent in this class of business."

Questions of general interest in the operations of manufactured gas companies featured the program during the second general session, held in the Auditorium ballroom on Wednesday. C. C. Atwood, chairman of the board of the Brooklyn Union Gas Co., delivered an interesting address on the progress which has been made in the prevention of accidents in the gas industry. Constant study in this field is helping to minimize the accident factor, he said.

A. J. Sarre, chairman of the New Orleans Public Service, Inc., spoke on the education of gas company employes to further improve the efficiency of the industry's workers, reporting continued progress in this field.

The question of fundamentals of gas rate making and a scientific rate structure for gas sales came in for thorough discussion by F. L. Daily, of Chicago, and F. A. Newton, chairman of the board of Commonwealth and Southern Corp., New York.

Liquefied Gases

Marketing of liquefied gases by the petroleum industry has created a new competitive problem for the gas industry, said Morse Dell Plain, president of the Northern Indiana Public Service Co. of Hammond, Ind. Mr. Dell Plain advocated the adjusting of gas rates on a "promotional basis" to meet the competition of other types of fuels, now being sold at extremely low prices, and suggested the co-operation of the petroleum and the gas industries in the marketing of liquefied gases.

"The marketing by the petroleum industry of some of its liquefied gases has brought into the industrial field a competition which may prove serious," he said. "It may very well be that our technical departments may find it desirable to develop a system whereby we, in the gas business, can make use of or distribute these liquefied gases as part of our regular service.

"The gas business is not a complete monopoly and a fair return upon a fair value of the property cannot always govern the rates charged and still secure for us the maximum volume of desirable load. The industry can very properly give attention to its rate structures more with the idea of meeting competition than of paralleling costs. We will have to be fully alive to the fact that we have competition of a very definite kind from other fuels which are today being marketed at greatly reduced prices. We must be prepared to meet this competition with rates of a distinctly promotional type."

Other topics discussed at this session included a discussion of the problems of dealer relationship, by Oscar H. Fogg, vice president of the Consolidated Gas Co. of New York, and a talk on "The Gas Company and the Better Home," by Mrs. J. Marc Fowler, former president of the Illinois Federation of Women's Clubs.

A comprehensive summary of the position of the natural gas industry, presented by Judge H. O. Caster, general counsel for Henry L. Doherty & Co., featured the closing general session on Thursday.

Other speakers at the closing session included Dr. Zay Jeffries, consulting metallurgist for the Aluminum Corp. of America, Cleveland, who presented a paper on "Exploiting Ideas," and B. C. Forbes, who presented his views on the business outlook.

Industrial Gas Section

The meetings of the industrial gas section developed a large attendance and shed considerable illumination on the rapid strides which are being made in that division of the industry. J. M. Watson, chief metallurgist of the Hupp Motor Car Corp., Detroit, and president of the American Society of Steel Treaters, spoke on "The Fuel Problem as the Manufacturer Sees It." F. B. Jones, director of industrial gas sales for the Equitable Gas Co., Pittsburgh, spoke on "Sales Problems of the Natural Gas Industrial Salesman," while H. O. Loebell, vice president of the Combustion Utilities Corp., New York, spoke on "Meeting a New Era of Competition in the Sale of Industrial Gas." D. W. Chapman, manager of industrial gas sales for the Peoples Gas Light & Coke Co., Chicago, served as chairman of the industrial gas section's meetings.

Officers elected by the publicity and advertising section for the coming year were as follows: Chairman, William H. Hodge, of the Byllesby Engineering & Management Corp., New York; vice chairman, Henry Obermeyer, Consolidated Gas Co. of New York.

Numerous problems affecting the operations of gas companies in the distribution of both manufactured and mixed gases were discussed during the sessions of the technical section. R. G. Griswold of Henry L. Doherty & Co., New York, served as chairman of this section. Some of the outstanding papers delivered were as follows: "The British Gas Industry," by J. Herbert Canning, president of the Institution of Gas Engineers, London; "Economics of Gas Distribution," by W. C. Beckjord, vice president, Boston Consolidated Gas Co.; "Gum and Problems Arising From Its Presence in Distributed Gas," by W. L. Shively, of the Koppers Research Corp., Kearny, N. J.; "Some Properties and Characteristics of Coating Materials and Specimens Removed in 1930," by Dr. Scott Ewing, A.G.A. Research Association, U. S. Bureau of Standards, Washington, D. C.; "Gas Mixtures, Their Selection, Utilization and Distribution," by J. A. Perry, United Gas Improvement Co., Philadelphia; "Gas Flames in Conversions to New Gases," by R. B. Harper, Peoples Gas Light & Coke Co., Chicago.

Honorary memberships were extended by the association to representatives of the following foreign groups: Institution of Gas Engineers of Great Britain, United Council of the Gas Industry in France, British Commercial Gas Association, Swiss Association of Gas & Water Engineers, and the German Gas & Water Association.

GULF COAST GASOLINE CONTINUES TO IMPROVE

HOUSTON, Tex., Oct. 19.—Continued improvement in gasolines was indicated in Gulf Coast refinery markets the past week. In contrast, however, fuel oils showed additional weakness which was reflected in a 10-cent cut in the posted price of bunker oil. No change materialized in gas oils or pale and red oils. The heavier viscosity lubs maintained a stiff front with very little material available from coastal refiners.

Gasolines as this is written have not as yet reflected the increased prices which have been enjoyed by North Texas although the market is decidedly strong with advances in line. Monday the bulk market range was held from 3¾ to 4 cents. Based on North Texas prices the posting should have been at a minimum of 4½ cents. Tank car prices of gasoline on the coast also are out of line with the general market strengthening with material available at 5½ cents.

Sellers are confident, however, that gasolines will witness an early improvement in the price situation as supplies in this area are now at a minimum and with a strong and advancing situation in other refining areas.

The reduction of 10 cents in bunker fuel places the margin between this product and bulk fuel the narrowest it has been in many years. The cut brings the bunker posting to 45 cents while bulk fuel is quoted from 40 to 45 cents. The increased competition at coastal terminals for bunker business has been responsible for this as well as a series of similar cuts within the last several months. Bulk fuel continues weak although 40 cents is being maintained as bottom. It is freely available at that figure, however, with very little demand.

Possibilities of increased demand for gas oils with the burner oil season at hand have prevented any important weakening of quotations and for the most part refiners are fairly well sold up.

The heavier viscosity lubs have continued tight although there still has been no change in the price structure. The lighter viscosity oils have been held steady in price reflecting the strength of the more active heavier grades.

GASOLINE SPECIFICATIONS BEHIND IMPROVEMENTS

(Continued from Page 31)

tion. A revision in the specification for Motor Gasoline appeared September 11, 1929. At the same time a specification for another grade, called Motor Fuel V was published. These are outlined in the table:

GASOLINE SPECIFICATION OF 1929

Motor Gasoline and Motor Fuel V

General—Free from water and suspended matter.

Corrosion—Negative.

	Temp., °F. Motor Gasoline	Motor Fuel V
Distillation—Per cent off:		
10	122/176*	122/149*
50	284	257
90	392	356
Endpoint	437	401
Recovery %	95	95
Sulphur %	0.10	0.10

*For each per cent less than 4 per cent the minimum 10 per cent shall be lowered 5.4 °F. Seasonal and climatic conditions may involve further modifications.

In these, it should be noted, both color and initial boiling point have not been mentioned.

The latest specification for U. S. Motor Gasoline which becomes mandatory after October 21, 1931, according to announcement of the Federal Specifications Board, July 21, 1931, is in outline as follows:

Corrosion—No more than slight coloration of copper strip after three hours at 122° F.

Evaporated, per cent	Distillation test Temp. °F.
10	167
50	284
90	392

Residue—Not over 2 per cent.

The per cent evaporated is the sum of the distillation loss and the quantity collected at each specification temperature.

Starting—The Government reserves the right to reject material during December to March, inclusive, in those localities where the normal mean temperature during January is less than 27° F. if when the thermometer reads 149° F. less than 10 per cent shall be evaporated.

Sulphur—Not more than 0.10 per cent.

Vapor pressure—Not over 12 pounds at 100° F. The Government reserves the right to reject material (a) in those localities where the normal mean minimum temperature during the month of January is greater than 27° F. if the vapor pressure at 100° F. exceeds 10 pounds per square inch; (b) during June to September, inclusive, if the vapor pressure at 100° F. exceeds 8 pounds per square inch.

The modern gasoline is so far superior to the first "high test" product that there remains little claim for kinship in the present day gasoline with the remote cousin of 25 years ago. Volatility is much higher and the efficiency is much greater. The gravity specification has been dropped and more recently that for color has been discarded. Research has demonstrated the influence of detonation and the refiner has by selection of the crude oil and improved refining methods succeeded in manufacturing a gasoline of high antiknock value, a desirable property which has not been recognized in the standard specifications.

REQUIRED TO USE ALCOHOL

NEW YORK, Oct. 19.—Oil marketers operating in Argentine will be required to absorb a total of 300,000,000 liters of alcohol, produced by the sugar and maize industries of that country, under the terms of a plan which the Argentine government is expected to announce shortly.

Argentine consumption of motor fuel is approximately 925,000,000 liters annually, and the government's plan would indicate that marketers will be obliged to market a blend of two-thirds gasoline and one-third alcohol. Similar plans are now in effect in several other countries where the marketing of excess alcohol production has been a problem.

GOVERNMENT TO GIVE DATA ON SHIPMENTS

(Continued from Page 95)

of the visible type of the wet hose eye measuring variety.

However, the largest number of gasoline pumps were meter pumps with disc-type meters, or any type meters using by-pass for adjustments, the number of that class with single meter, single or double outlet, being 15,736, of which 13,556 were power operated and 2,180 were hand operated, and the number of meter pumps with two meters, two or more outlets, was 951, of which 845 were power operated and 106 were hand operated.

Meter pumps with piston type meters, not using by-pass for adjustments and with single meter, single or double outlet, numbered 8,728, of which 8,697 were power operated and 31 hand operated. Meter pumps with two meters, two or more outlets, numbered 319, all power operated. Airport fueling units numbered 33 and masonry insert units 25.

Other pumps not included in the foregoing were lubricating oil outfits numbering 43,362; other lubricating oil pumps (including barrel pumps), 48,805; kerosene pumps, 4,257; grease pumps, 18,860; and all other pumps 242. Of the foregoing pumps other than gasoline, 3,224 were power operated and 112,302 were hand operated, the total value of which, f.o.b. factory was $931,768.

For the month of August shipments of gasoline pumps, power operated, numbered 4,480 and hand operated 3,263, the total value of which, f.o.b. factory, was $728,326.

Other shipments of pumps during August (including lubricating, kerosene, grease, etc.), numbered 501 power operated and 22,708 hand operated, the value of these two classes of pumps being $193,718.

Requests for statistics covering shipments of pumps used in the oil industry were so urgent that the Census Bureau has decided to issue them monthly now that they have been assembled for the first time.

DEATH OF LOUIS WALZ, VETERAN OIL REFINER

OIL CITY, Pa., Oct. 17.—Louis Walz, director in the Pennzoil Co. and one of the best known oil refiners in the East, died at his home in this city on Thursday and was buried today in Grove Hill Cemetery. Funeral services were held in the family home, the Rev. Edward Kuhlmann, pastor of the First Lutheran Church, officiating.

Mr. Walz had been in poor health for some time but his condition was not regarded as serious until a week before his death. His daughter, Mrs. Leonard Warren, died recently and Mr. Walz felt the loss keenly and it is believed that Mrs. Warren's passing had much to do with shortening the life of the veteran refiner.

Mr. Walz was born in Germany in 1846. In his early manhood he was a carpenter and millwright and when he came to this country followed his trade in Titusville, where he arrived in 1868, and later in Oil City.

Mr. Walz was one of the organizers of the Independent Refining Co. He remained with the company three years and then sold out his interests and started the Continental Refining Co. In July, 1886, he disposed of his company and joined Henry Suhr and Samuel Justus in the organization of the Penn Refining Co. This company operated for years, undergoing several expansions and mergers, including one with the Germania Refining Co. Mr. Walz was general manager of the Penn-American Refining Co., as the merger became known, but retired from active management when the company merged with others into the Pennzoil Co. In 1922 Mr. Walz served as vice president of the Pennzoil Co. and was made a member of the board of directors. He resigned the vice presidency but retained his directorship up to the last.

Mr. Walz was one of that independent group which about 40 years ago organized the old Pure Oil Co. and the United States Pipe Line Co. which were later purchased by the Ohio Cities Gas Co.

Deceased was always a progressive business man and a diligent worker. He kept abreast of the rapid developments in the refining industry and was greatly interested in the advancement in all branches of the petroleum industry.

Mr. Walz was united in marriage with Miss Frederik Teege, who preceded him in death on December 27, 1926. He is survived by the following children: Mrs. Emma Kerr at home; George J. Walz of Rochester, N. Y.; Albert C. F. Walz of Oil City; Mrs. Frank O. Welch of Glendale, Calif.; Mrs. Albert Kay Rheem and Mrs. John Harper of Franklin; W. Edward Walz of Los Angeles, Calif.; and Louis W. Walz of Batavia, N. Y. Nineteen grandchildren and five great-grandchildren also survive.

REPORT ON TESTS FOR PETROLEUM PRODUCTS

The American Society for Testing Materials has issued the annual report of its Committee D-2 on petroleum products and lubricants, together with the reports of several subcommittees. Included in this publication are 33 standard methods of test and 14 tentative test methods for products in this field. The book comprises 267 pages.

Standard methods of test are included for the determination of bitumen; burning quality of kerosene oils and of mineral seal oils; carbon residue of petroleum products; cloud and pourpoints; color of lubricating oils, of petrolatum and of refined petroleum oil. Tests for the dilution of crankcase oils, distillation of crude petroleum, gasoline, naphtha, etc., flashpoints, gravity by means of the hydrometer, and the analysis of grease are also given.

Included are standards for testing electrical insulating oils; melting point of paraffin wax and of petrolatum; penetration of bituminous materials and of greases and petrolatum; precipitation number of lubricating oils; sampling; saponification number; softening point of bituminous materials; sulphur in gasoline and in motor fuels, etc.; also tests for thermal value of fuel oil; vapor pressure of gasoline; viscosity of petroleum products; water and sediment in petroleum products, and several other standard methods of test.

Tentative definitions of terms relating to petroleum products are given and the personnel of Committee D-2, which is one of the largest A.S.T.M. committees, is also included. The price of the book is $1.25. It can be obtained from A.S.T.M. headquarters, 1315 Spruce Street, Philadelphia, Pa.

GEOLOGICAL PUBLICATIONS

With the closing of the Oklahoma Geological Survey, Norman, Okla., because the State did not provide funds for its maintenance it is necessary to temporarily discontinue distribution of publications. It is understood that under a new arrangement it is now possible to secure any publication in print by addressing the Oklahoma Geological Survey, Norman, Okla., and a clerk appointed to take care of the correspondence will mail literature required. There is a small additional charge made over the list price for this service and new price lists are available on request, but if it is necessary to order without this list at hand it is suggested that about 5 per cent be added to the prices shown on the old list issued during Doctor Gould's regime.

SPECIFICATIONS PERMIT 6.5 REID VAPOR PRESSURE

(Continued from Page 90)

be tested, covered with a loose glass cover over the neck, to prevent the ingress of dirt, etc., is inclosed in a dry bomb with the bomb and contents at room temperature.

b. The finished fuel is the base gasoline to which tetraethyl or aromatics have been added in amounts not to exceed that permitted by this specification.

c. The bombs shall be twice-filled with oxygen at 95-100 pounds per square inch pressure and at the pressure released at the bomb charging valve, in order to flush out air contained in the bomb. The bomb shall then be charged with oxygen at 95-100 pounds per square inch pressure for a third time, the charging valve closed and the bomb disconnected from the oxygen charging line.

d. The bomb and contents shall then be immersed for four hours in a steam bath or water bath heated to 98 to 100° C. (208 to 212° F.). At the completion of the four-hour period, the bomb is removed and rapidly cooled with water while the charging valve is still closed. The pressure is released gradually and the bottle removed.

e. The contents of the bottle are then drained. To remove any insoluble gum in the bottle, two washings of 15-20 ml. of a mixture of one part C. P. acetone and one part C. P. benzene shall be used. These washings are added to the oxidized sample and the mixture carefully shaken after which it shall be filtered.

f. One hundred ml. of the mixture (oxidized sample plus gum solvent) is then evaporated to dryness on a steam bath in accordance with Method 530.1 except that a glass dish[1] shall be used. The dish is finally transferred to an electric air oven maintained at 110°, plus or minus 5° C. (230°, plus or minus 9° F.). After two hours in the oven the dish is placed in a desiccator containing anhydrous calcium chloride as a drying agent for 20 minutes, after which the dish is weighed. The difference between the original and final weights of the dish is the weight of residue.

g. Details of the equipment used by the Air Corps for the above test will be supplied upon request to the Chief, Material Division, Wright Field, Dayton, Ohio.

Determination of Tetraethyl Lead

a. Gravimetric:

$$PbEt_4 \rightarrow PbBr_2 \rightarrow PbCrO_4$$

Measure with a pipette 100 ml. of gasoline containing tetraethyl lead in a 400 ml. beaker. Add slowly a solution of 30 per cent bromine in carbon tetrachloride, until the permanent brown-red color of bromine is obtained. Filter promptly (and separate solid) through asbestos in a dry Gooch crucible or preferably through a fritted Jena glass filter crucible of No. 2 porosity, and wash with dry petroleum ether. Put crucible back in a beaker where precipitation was made and add about 3 ml. of concentrated nitric acid (specific gravity 1.40) in the crucible. Add a warm solution of 10 per cent nitric acid in quantity just sufficient to cover the height of the crucible, bring to boiling, remove the crucible, and boil down to about 3 ml. volume. Dilute, and filter the solution through soft filter paper (if Gooch crucible was used) and rinse the beaker and crucible with warm water. Just neutralize filtrate with ammonium hydroxide and add 5 ml. of 50 per cent acetic acid. Treat with 10 ml. of 10 per cent solution of K_2CrO_4 and boil until the precipitate has well coagulated and the solution has a strong orange color. Let it set for an hour and filter the solid through an ignited and weighed Gooch crucible and reweigh as $PbCrO_4$.

Calculation:

$$\frac{PbCrO_4\ (323.4)\ 37.85\ =}{(323.2)\ 1.65}$$

$(PbCrO_4)\ 22.9 =$ ml. PbEt, per gallon.

b. Volumetric:

$$PbEt_4 \rightarrow PbBr_2 \rightarrow PbMoO_4$$

The ammonium acetate solution of lead is prepared as above.

The solution is then boiled down to 150 ml. and titrated hot with a standard molybdate solution, until a yellow coloration is obtained with tannic acid used as outside indicator. The molybdate solution is made to contain 2.380 grams of commercial C.P. salt; one ml. of this solution used on an original 100 ml. sample corresponds to 0.1 ml. of tetraethyl lead per gallon of gasoline. The solution is standardized against a known weight of Pb or $PbCl_2$. The indicator used is a 0.5 per cent freshly prepared solution of tannic acid. Care shall be taken to use always the same amount of indicator (two drops) and solution (four drops). A blank is run on the same amount of water and ammonium acetate, and the amount of molybdate solution used to give a distinct coloration (about 0.3 ml.) is subtracted from the result of the titration.

Note 1—Gasolines containing a high percentage of unsaturated compounds absorb bromine vigorously with evolution of heat. In such cases it is highly advisable, in order to avoid losses of material, to add the bromine slowly and to keep the beaker in ice.

Note 2—Some gasolines, when treated with bromine, give a tarry liquid insoluble in gas. In such cases, the precipitated $PbBr_2$ should be washed with special care with petroleum ether in order to remove the tar thoroughly before the precipitate is dissolved in nitric acid.

Distillation Test

The distillation test shall be made in accordance with Method 100.13 with the exception that the procedure outlined in Section 9 of this method shall be changed to the following:

When everything is in readiness, heat shall be applied at a uniform rate, so regulated that the first drop of condensate falls from the condenser in not less than 5 nor more than 10 minutes. When the first drop falls from the end of the condenser, the receiving cylinder shall be moved so that the end of the condenser tube shall touch the side of the cylinder. The heat shall then be so regulated that the distillation will proceed at a uniform rate of not less than four nor more than five c.c. per minute. When the reading of the distillation thermometer is 75° C. (167° F.), 100° C. (212° F.) and 135° C. (275° F.), the volumes of distillate in the graduate shall be observed and recorded.

After the volume of distillate in the graduate has reached 90 c.c. the heat may be increased because of the presence of the heavy ends which have relatively high boiling points. However, no further increase in heat shall be applied after this adjustment. The 4 to 5 c.c. rate can rarely be maintained from the 90 per cent point to the end of the distillation, but in no case shall the period between the 90 per cent point and the endpoint be more than five minutes.

The heating shall be continued until the mercury reaches a maximum and starts to fall consistently. Usually this point will be reached after the bottom of the flask has become dry.

The total volume of the distillate collected in the receiving graduate shall be recorded as the recovery.

The cooled residue shall be poured from the flask into a small cylinder graduate in 0.1 c.c., measured when cool, and the volume recorded as residue.

The difference between 100 c.c. and the sum of the recovery and the residue shall be calculated and recorded as distillation loss.

The distillation loss shall be added to each of the volumes of distillate in the graduate at the three temperatures specified, and the values thus obtained shall be recorded as the percentages evaporated at these temperatures.

Section 10 of Method 100.13 shall also be changed to read: With proper care and attention to detail, duplicate results on percentage evaporated should not differ by more than 2 c.c.

Reasons for Specifications

This fuel is intended for use in hot running and high compression or supercharged engines.

A high cylinder temperature of 150° C. plus or minus 5° C. for the cooling water is necessitated by the relative deterioration in antiknock value at high cylinder temperatures of fuels owing their antiknock property to cracking or high aromatic content. The test procedure specified only partly duplicates the relative deterioration of unsaturated and aromatic compounds observed in tests of hot-running multicylinder aircraft engines. The addition of tetraethyl lead to a gasoline containing any considerable quantity of aromatic or unsaturated compounds does not, in general, diminish the

[1] A "Pyrex" glass dish, 90 mm. diameter by 50 mm. deep is suitable for this evaporation.

relative loss of antiknock value. The method of test for antiknock value is somewhat arbitrary but is tentative and will be modified to allow alternate methods as such become available, and have been the subject of comparative test.

The accelerated oxygen aging test specified is tentative pending the completion of an investigation by the Bureau of Standards of accelerated aging tests which duplicate storage conditions. This test has been found to bear some relation to the development of gum in storage. Furthermore, it has been found that the type of gasoline with which the Air Corps. has heretofore operated will stand the test with ease.

The requirement of a Reid vapor pressure of 6.5 pounds per square inch at 37.8° C. (100° F.) is necessary to avoid vapor lock with present fuel systems in Air Corps equipment which was developed on fuel with 4 to 6 pounds per square inch Reid vapor pressure. Pending improvement in the fuel systems of this equipment, reasonably safe operation can only be secured with 6.5 pounds vapor pressure and even this value provides no adequate margin of safety under exceptional atmospheric conditions.

All tests of antiknock value conducted by the various activities of the air corps will be conducted under the following conditions:

(a) Calcium chloride air dryer will be used on carburetor air.

(b) Temperature plug will be used for measuring knock. (The mixture strength producing the maximum temperature plug and cylinder temperature with a fuel containing tetraethyl lead is almost invariably richer than that necessary to produce maximum bouncing pin reading.)

When tetraethyl lead is added to the fuel, the required minimum intensity of color is obtained by the addition of 3 ml. of tetraethyl lead per U. S. gallon in the form of blue 1T Ethyl fluid.

GASOLINE PIPE LINE EXPANSION IMMINENT

(Continued from Page 13)

competing with each other in the territories traversed by the lines.

Gasoline pipe lines usually are built along main highways. It has been found other main highways cross the one followed at fairly regular intervals and that splendid locations for bulk stations and distributing plants can be found every 100 miles.

The tariffs filed by the gasoline pipe line companies are almost identical with those charged by the railroads. Consequently, there is no advantage to the refiner without his own pipe line shipping his gasoline through the line of another company. His transportation cost is the same whether he ships by pipe line or railroad.

Should the Interstate Commerce Commission grant the increase in freight rates asked by the railroads and apply any of this increase to tariffs for the transportation of petroleum or its products, the advantage now held by refiners owning interests in gasoline pipe lines, over their competitors, will be increased to just that extent. In other words, there will be a greater difference in transportation costs with the refiner without pipe lines paying just so much more while the cost to the refiner with a pipe line will be no more than at present and that cost, as stated above, is more than 1 cent a gallon less from the Mid-Continent to Chicago territory.

One Line Starts Others

The construction of one gasoline pipe line from a refining area to a competitive market most certainly will result in the building of other such pipe lines by other refiners who may not have an interest in the first line. Competition will force the construction of such lines.

Progressive companies in many areas are seriously considering the question of building pipe lines to transport their gasoline. The Standard Oil Co. of New York has announced it intends to go ahead with the building of 100 miles of line into its marketing territory in New England. The Sun Oil Co. has recently completed its gasoline pipe line system across Pennsylvania with extensions in Ohio and New York states. In the Mid-Continent area the question is especially important with a number of refiners realizing the successful operation of existing gasoline pipe lines places them at a disadvantage which can only be overcome by the construction of their own lines.

Texas Independents Meeting at Tyler Active for Tariff

TYLER, Tex., Oct. 19.—Wirt Franklin of Oklahoma City, president of the Independent Petroleum Association of America, opened the semiannual convention of the Texas association here today.

Among the recommendations made in President Franklin's address was that a tariff of at least $1 a barrel on crude and 50 per cent ad valorem on refined products be imposed to prevent a surplus of production over consumption. Even a 5 per cent overproduction is disastrous to price, as in the case of other primary products, he said.

Speakers at the morning session included Earle B. Mayfield, Col. T. N. Jones of Tyler and Gen. Jacob F. Wolters, all of whom declared themselves in favor of a tariff on oil imports, General Wolters pointing out that as early as 1900 he had written into the state democratic platform a demand for such a tariff.

W. Hardy of Breckenridge, chairman of the oil and gas committee of the lower house, cited figures on national and world oil production and prices in 1930 and 1931 to show that, while world production declined 4 per cent in 1930, prices dropped from 145 to 95 per cent. During this period he said foreign production increased 9 per cent, most of it on account of activities of American-owned companies.

Railroad Commissioner C. V. Terrell told of talks with the two Texas senators and Congressman Garner on the subject of an oil tariff while he was in Washington recently on a rate matter before the Interstate Commerce Commission. He also talked with Secretary Lamont and a number of others on the same subject, Lamont objecting, he reported, that the major importing companies have invested millions abroad which they quite probably would not like to lose.

Regarding prophecies of depletion Congressman Sanders read figures on production to show that all estimates of total supply have been exceeded by production to date and declared it is still impossible to form any idea concerning the oil resources of the United States because they are practically limitless.

The recommendations of the Oil States Advisory Committee at Oklahoma City on September 11 to Secretary Lamont, presented to him September 24, which were to have been read by Capt. J. F. Lucey, were read in the latter's absence by President Franklin.

The recommendations asserted that the importing companies, with the exception of the Gulf, had broken faith with the independent producers by continuing to increase imports while domestic production was being curtailed and recommended that imports be closely limited. Gulf, it was explained, had more than lived up to its agreement by reducing imports some 29 per cent. The recommendations were signed by Thurman Hill, chairman, C. V. Terrell and Franklin, among others.

FIRST RUSSIAN DIESEL

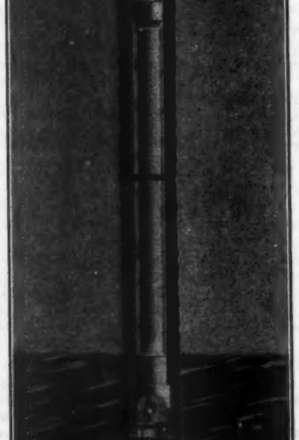
NEW YORK, Oct. 17.—The "Russian Diesel" factory at Leningrad has completed the construction of the first Soviet engine for oil-burning locomotives, according to designs developed by the Leningrad Power and Technical Institute in collaboration with the engineers of the factory.

Preliminary experiments with the new engine have been satisfactory, and it is expected that further units of this type will be constructed.

Development of Diesel power by Soviet authorities, it is expected, will in time lessen the selling pressure on Russian Diesel oil in export markets.

NEW DEVICE CEMENTS CASING WITH LINER

The Halliburton Oil Well Cementing Co., Duncan, Okla., is prepared to furnish a cementing device which not only allows the continuous cementing of a combination string of casing (which is a string consisting of casing with perforated screen or liner on the bottom, the liner being the same diameter as the casing), but provides a simple means for washing the perforated liner or screen to bottom prior to cementing. This washing feature does away with the necessity for a wash pipe and consists of an inner lining material to cover the perforations to allow circulating around the bottom of liner or screen perforations when running casing. The lining material is cut and washed out of the casing immediately after the cementing plugs are drilled, and is so treated as to prevent clogging of the perforations.



Halliburton method and apparatus for cementing combination strings consisting of same size liner and casing.

The cementing feature consists of ports through which the cement passes, the ports being closed until the cement reaches them, at which time they are opened by means of the cementing plugs.

Among the advantages for this device, besides allowing the running of both liner and casing in a full-sized hole and the elimination of a wash pipe which has many disadvantages, is that it affords a simple means for continuous running and cementing of the combination string and thorough washing of the screen to bottom. This eliminates danger of the perforations being plugged by cavings.

CALLS FOR ACTION IN TAX EVASION PROBLEM

CHICAGO, Oct. 19.—The recent editorial in The Oil and Gas Journal entitled "Vigilantes Needed" was warmly commended by Frank V. Martinek, chairman of the Chicago committee and of the commission appointed by Governor Emerson of Illinois to investigate evasion, in an interview with the Journal's Chicago representative.

"Our committee considers that The Oil and Gas Journal very concisely and forcefully summed up both the damage that has already been done by gasoline tax evasion and the dangers that lie ahead unless something very vigorous is done at once to stop the activities of evasion 'racketeers'," Mr. Martinek said.

"We should like to support especially the Journal's call for action by the industry itself. The situation calls for efforts to secure uniform state laws and to vitalize enforcement of existing laws by the proper officials. But it demands even more prompt action within and by the industry itself. Official funds for investigative work to run down the evaders and get the evidence necessary to stop their practices are limited and altogether inadequate for the task. The industry must help by making its own investigations and gathering evidence that can be turned over to the authorities. Plans for nation-wide co-operation in this effort will doubtless be presented at the next meeting of the American Petroleum Institute, but meanwhile much can be done if oil companies will join in formation of local or regional committees such as our committee in the Chicago area and act at once to discover, punish and prevent evasion."

Exhibit of Texas Company Attracts Consumer Interest

NEW YORK, Oct. 17.—A temporary exhibit maintained by The Texas Company in a showroom at 29 West Fifty-seventh Street here catches the eyes of more than 2,000 persons daily, and is so attractive to many of them that they enter and spend an average of 20 minutes learning how oil is produced, refined and marketed. To these persons dozens of Texaco road maps are distributed daily.

Most of the visitors at the exhibit are automobile drivers—many of them are out-of-town visitors. Very keen interest is shown in the models of drilling and pumping oil wells, a scale model of the "Australia," a Texaco tanker, a "bubble tray" illustrating the process of fractionation, a display of filtering clays and objects showing the dewaxing process, etc.

A white enameled automobile engine, part of its cylinder block cut away to show the parts moving smoothly in a bath of "Texaco" motor oil, is one of the principal window attractions. Another attention getter in the window is a frame containing a number of glass tubes of Texaco motor oil, a small steel ball in each tube pushing its way down through the oil, as the frame tips from side to side, demonstrating the viscosity of each grade.

Many other displays are in motion. A model of The Texas Company's No. 4 Stevenson well at Humble, Tex., pumps oil, seemingly from a sandy subsurface, into a receiving tank. A cross section chart of an oil field shows the various strata through which a well has been drilled.

A striking exhibit shows a stream of Texaco motor oil flowing through the freezing unit of a refrigerator at zero temperature. Another machine shows the perfect flow of the same oil at 125° F. An airplane engine, similar to the one used on the Texaco No. 13, Frank Hawks' ship, is set in slow motion to show the sequence of firing in the cylinders. A detonation machine illustrates the difference between regular gasoline and gasoline which has been blended with Ethyl fluid.

A group of Texaco packaged products, a roofing display, a service station model, sections of pipe lines and well casings, photographs of producing and pipe line operations, and a painting showing the movement of oil from the well to the consumer are of interest. In a showcase are metal articles made by the Chinese from empty Texaco cans and artistically lacquered objects fashioned from wooden cases that once contained Texaco products.

This exhibit, just around the corner from bustling Fifth Avenue, is becoming a center of specialized knowledge for university classes and students of scientific subjects.

U. S. Supreme Court Takes Jurisdiction In Champlin Appeal

WASHINGTON, D. C., Oct. 19.—The United States Supreme Court has found that Champlin Refining Co. has shown probable jurisdiction in its appeal from the lower court decision last February refusing to grant a preliminary injunction against enforcement of the Oklahoma oil conservation law.

As the three-judge court sitting at Guthrie in August reaffirmed that decision on final hearing it will be necessary now for the Champlin company to file another appeal from that decision. It is though probable, following today's ruling on the appeal on the preliminary injunction, the Supreme Court will also take jurisdiction on the appeal from the final decision at Guthrie, which, in the routine course, may be a matter of several months.

The taking of jurisdiction, of course, is no indication of what the court's decision in the case may be. It is understood the Champlin company's counsel are preparing an appeal from the final decree and that it will be docketed at Washington during the coming week.

The case of Constantin, Rather and the Brock Lee Oil Co., in which Federal District Judge Bryant of Tyler, Tex., granted a temporary injunction against enforcement of the East Texas conservation law, will come up for hearing by a three-judge federal court at Beaumont, Tex., October 29 when Circuit Judge Hutcheson will preside.

Meanwhile, in the Texas state courts, on agreement with counsel, the Third Court of Civil Appeals, has set Thursday, November 19, to receive the submission of the appealed case involving the right of the Texas Railroad Commission to make oil proration orders. The case is styled Danciger Oil & Refining Co. vs. Railroad Commission et al from Travis, wherein District Judge C. A. Wheeler upheld the right of the commission to make the orders and sustained the particular orders which applied to the Panhandle Field where the Danciger company resisted the proration orders of the commission.

TIDE WATER ASSOCIATED WILL NOT BE IN MERGER

(Continued from Page 96)

771,400 after interest, depreciation, depletion, intangible development costs, etc. This compares with net profit of $4,844,000 equal to $1.80 a share (par $25) on 2,696,642 shares of stock in first nine months of previous year.

Net profit for quarter ended September 30, 1931, was approximately $1,241,600 after charges and taxes, equal to 46 cents share (par $25) on 2,696,642 shares of stock, comparing with net loss of $1,850,162 in preceding quarter and net profit of $2,025,600 or 75 cents a share in third quarter of 1930.

CRUDE PRICE CHANGES

(Continued from Page 94)

same day the Seep Purchasing Agency (South Penn Oil Co.) posted a price of $2.15 for Bradford oil in National Transit lines.

The Crew-Levick Co. and Valvoline Oil Co., effective October 13, posted $2.05 per barrel for Pennsylvania Grade oil purchased in their territory in Pennsylvania.

COLLECT CHAIN TAX

The State of Indiana will start immediately to collect back taxes based on its chain store tax law. The United States Supreme Court last week denied a petition for rehearing on its decision at the last term holding the law constitutional. The tax applies to filling station operation. The Standard of Indiana will be the largest taxpayer among the oil companies.

OKLAHOMA OIL MEN DISCUSS TAX MEASURES INITIATED BY MURRAY

The annual meeting of the Kansas-Oklahoma division of the Mid-Continent Oil and Gas Association was held in Tulsa on Tuesday at which the executive committee to serve during the coming year was elected. The most important other business before the meeting was the discussion of the initiative tax measures in Oklahoma sponsored by Governor William H. Murray, all of which affect the oil men of the State as they affect other business men, but two of which are of particular interest to men and corporations engaged in the oil business.

In regard to the income tax and the matter of the extension of the present 5-cent gasoline tax, which, in particular affect the oil man, Harry H. Smith, secretary and general counsel for the association, has the following to say in the Mid-Continent Bulletin, the monthly organ of the association:

Depletion Limited to Cost

"The income tax bill denies Federal depletion to the oil producer. The carefully worked out formula by which the Federal Government has arrived at a reasonable allowance for depletion is ignored in the pending bill. The provision is that the Oklahoma Tax Commission shall make rules and regulations for the determination of the depletion deduction which, in no event, shall exceed that based upon cost of the particular property. In other words, the tax commission is at liberty to arbitrarily fix the depletion deduction at anything less than cost and thus ignore the hazards of the industry, the necessity for a replacement fund and all the other scientific reasons which underlie the Federal provisions. If enacted, this will be a very severe blow to the independent oil producers and royalty owners of the State. It will tend to discourage them as well as larger operators.

"The Federal Government already levies income taxes extending up to 25 per cent on individuals and 12½ per cent on corporations. The addition of the proposed 10 per cent rate in Oklahoma would cause an Oklahoma citizen to face a total income tax levy in the highest brackets of 35 per cent and a corporation 22½ per cent. The proposed state bill does not even allow the deduction of Federal income taxes in computing income subject to state income tax rates. These rates will tend to force all sales agencies and companies to remove their headquarters out of the State in order to escape the prohibitive burden.

Gasoline Tax Extension

"Notwithstanding the fact that the present 5-cent gasoline tax is not being enforced and probably cannot be enforced in this State because of evasion, embezzlement and abuse of exemptions, it is proposed to continue the tax at 5 cents until February, 1933, and to use the extra or fifth cent for unemployment and other charitable purposes with all the attendant waste and futility. Figures recently published show that the raising of the gasoline tax to 5 cents per gallon in this State has reduced the revenue below what was received from the previous 4-cent tax, and since one-fifth of the total was diverted to purposes other than roads, the revenue available for roads in this State in the four months of April, May, June and July of this year was actually $1,067,000 less than it was under the 4-cent tax for the same months of the previous year, or a loss to the roads of about $3,000,000 per annum.

"Good roads enthusiasts and county commissioners view this loss of revenue with alarm. They are now, however, faced with the perpetuation of this condition and are further confronted with the repeal in the ad valorem amendment of the one-fourth mill state levy for local roads and the one-fourth mill levy for school purposes.

"It is difficult to conceive of the reason for these proposed tax bills. In the absence of any provision for reducing governmental expense such as the county unit system for common schools by which several millions of expense could be saved annually and in the absence of any provision for abolishing other unnecessary spending agencies of the State and in view of the proposed expenditures for free text books, unemployment, etc., which are new and additional burdens, the program cannot be said to be one of economy. With the certainty that valuations of real and personal property will have to be raised materially in order to obtain necessary ad valorem tax with which to continue to support county, township, school district and city government, it cannot be said that the sum total of ad valorem taxes will be reduced.

"Continuance of the exorbitant 5-cent gasoline tax will merely perpetuate the condition of evasion, and discrimination against legitimate distributors and producers and dissipate the road revenue.

"Whatever the proposed income tax would yield, the State's portion one-fourth would not make up for the loss of the $5,000,000 per annum now received by the state government from the 3 mill state ad valorem levy which is to be abolished by the amendment and therefore there is no prospect of reducing the appalling state deficit which threatens.

New Executive Committee

In the election of the executive commitee most of the outgoing members were re-elected, but the following new members were chosen to take the place of members having died or resigned, or who are not candidates for places on the 1932 committee:

Ralph B. Roark, Shell Petroleum Corp.; H. L. Phillips, Sinclair Oil & Gas Co.; Clay Tallman, Stanolind Crude Oil Purchasing Co.; K. Winship, Gypsy Oil Co.; Ralph Prior, Skelly Oil Co.; Otis McClintock, First National Bank, Tulsa; J. E. Holm, Atlantic Oil Producing Co.; J. H. Gardner, Gardner Petroleum Co.; S. W. Howland, Gates Oil Co.; A. B. Imel, Blackwell Oil & Gas Co.; Carl Haun, Harris & Haun; R. M. Young, Carter Oil Co.; Baird H. Markham, Continental Oil Co.; S. J. Hernstadt, Gilmer Oil Co.; A. M. Gee, Mid-Kansas Oil & Gas Co.; H. J. Morlang, Oil Well Supply Co.; J. L. Shakely, Frick-Reid Supply Corp.; C. H. Wright, Sunray Oil Corp.; Harry H. Diamond, Harry Diamond Oil Co.; John B. Grieves, Terlton; E. A. Haines, Alva; James Davis, Hazlett, Davis, Bradford & Frazier.

Members of the executive committee who died during the past year were R. A. Griffith, president of the Sinclair Oil & Gas Co.; E. B. Lawson, oil producer, Tulsa; Henry McGraw, vice president of the Gypsy Oil Co.; F. A. Pielsticker, vice president of the Skelly Oil Co.

The old board of officers were nominated without opposition to serve for the coming year. These are Alvin Richards, Pure Oil Co., president; Rush Greenslade, Gypsy Oil Co., vice president; T. C. Johnson of Wichita, vice president for Kansas; John H. Kane, Phillips Petroleum Co., vice president for northern Oklahoma; Wirt Franklin, Wirt Franklin Petroleum Corp., vice president for southern Oklahoma; Harry H. Smith, secretary and treasurer.

Oppose Whole Program

The association adopted a resolution introduced by C. C. Herndon, vice president of the Skelly Oil Co., registering opposition of the Mid-Continent Oil and Gas Association to Governor Murray's entire initiative program "because of its unsoundness and danger" and directing the board of directors to conduct a thorough

CALIFORNIA CRUDE OIL PRICES

(Continued from Page 93)

ASSOCIATED OIL CO. PRICES

Associated Oil Co. prices, effective June 20, are as follows:

Ventura Avenue, 22 gravity, 58 cents, with 2 cents added for each degree upward to and including 30 gravity, which is 74 cents.

Kettleman Hills, 30 gravity and above 66 cents.

Potrero, 24 gravity, 69 cents, with 2 cents added for each degree upward to 34 gravity, which is 69 cents.

UNION OIL CO. OF CALIFORNIA

Crude Oil Prices for Its Purchases at the Well for Crude Produced in Strict Accordance With the Production Allocations Made by the California Statewide Curtailment Committee Effective 7 a.m., June 20, 1931

(All gravities above these quoted take highest price for that field)

Gravity °A.P.I.		Signal Hill	Alamitos Heights, Seal Beach	Huntington Beach	Athens, Rosecrans, Domingues	Torrance	Santa Fe Springs	Playa Del Rey*	E. Coyote, Richfield	Montebello	Santa Paula	Orcutt	Coalinga	Lost Hills	McKittrick, Kern River, Sunset-Midway, Elk Hills, Buena Vista Hills	Gravity °A.P.I.
11-13.9	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	$.50	11-13.9
14-14.9	.....	$.65	$.65	$.65	....	$.65	....	....	$.65	$.65	$.65	$.55	$.55	$.55	.55	14-14.9
15-15.9	.....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	15-15.9
16-16.9	.....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	16-16.9
17-17.9	.....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	17-17.9
18-18.9	.....	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	18-18.9
19-19.9	.....	.65	.65	.65	....	.65	....	$.65	.65	.65	.65	.55	.55	.55	.55	19-19.9
20-20.9	.....	.65	.65	.65	....	.65	....	.65	.65	.65	.65	.56	.56	.55	.55	20-20.9
21-21.9	.....	.65	.65	.65	....	.65	....	.66	.66	.65	.65	.57	.57	.55	.57	21-21.9
22-22.9	.....	.65	.65	.65	....	.66	....	.67	.67	.65	.65	.59	.55	.59	.58	22-22.9
23-23.9	.....	.67	.67	.67	....	.67	....	.68	.68	.65	.65	.61	.55	.60	.58	23-23.9
24-24.9	.....	.69	.69	.69	$.69	.68	$.65	.69	.69	.65	.66	.63	.55	.62	.61	24-24.9
25-25.9	.....	.71	.71	.71	.71	.70	.65	.70	.70	.65	.68	.65	.57	.64	.64	25-25.9
26-26.9	.....	.73	.73	.73	.73	....	.65	....	.72	....	.70	.67	....	.66	.66	26-26.9
27-27.9	.....	.75	.75	.75	.75	....	.68	....	.74	....	.72	....	....	.67	.68	27-27.9
28-28.9	.....	.77	....	....	.77	....	.71	....	....	....	.74	....	....	.69	.71	28-28.9
29-29.9	.....	.79	....	....	.79	....	.73	....	....	....	.76	....	....	.71	.74	29-29.9
30-30.9	.....	.81	....	....	.81	....	.75	....	....	....	.78	....	....	.72	.76	30-30.9
31-31.9	.....	....	....	....	.83	....	.78	....	....	....	....	....	....	....	....	31-31.9
32-32.9	.....	....	....	....	.85	....	.80	....	....	....	....	....	....	....	....	32-32.9
33-33.9	.....	....	....	....	.87	....	.83	....	....	....	....	....	....	....	....	33-33.9
34-34.9	.....	....	....	....	.89	....	.85	....	....	....	....	....	....	....	....	34-34.9

*Subject to a gathering charge of 5 cents per barrel.

educational campaign to reach all the voters to accomplish the defeat of the measures. The adoption of the resolution puts the oil men squarely against not only those measures affecting the oil industry but affecting other Oklahoma industries including cotton.

GENERAL ADVANCE IN OKLAHOMA MARKET

(Continued from Page 12)

selling excess Mid-Continent material for coastwise or export movement. This in effect means that the Mid-Continent market must depend entirely on interior outlets within the Mid-Continent and Middle West.

It is pointed out in this connection that the Gulf Coast and East Coast markets are always slow in reflecting an upturn in the Mid-Continent market. If the improvement in the Mid-Continent market can be continued long enough, it is felt that past experience will be duplicated and the coastal markets will be advanced so that the usual price relationship is obtained between the several refining areas. The eastern market has had additional supplies of California gasoline to absorb in recent weeks and eastern refiners have also lost some export business to West Coast refiners and this has tended to weaken prices.

Gasoline and Naphtha

So far as open market material was concerned the gasoline market was never tighter than it was the first two days of the week. This applied to the entire Mid-Continent. Several refiners continued to buy all the specification U. S. Motor material offered and some sales of the higher gravities were reported. In making these purchases, the refiners did not confine their activities to Oklahoma. Purchase orders were placed in the Chicago market and material purchased regardless of whether it was being sold direct by refiners or through brokers. A few of the latter have had gasoline for delivery over October and ordinarily this would have tended to weaken the market as it was bought at prices under the present market. Most of this gasoline has been purchased by refiners for shipment to their own stations or jobber customers and its appearance in the market has been of short duration.

It is believed that as the month advances more and more jobbers who have been waiting for lower prices will find it necessary to make purchases and this buying coupled with the refinery purchases will tend to bring additional price strength. In this connection there is some discussion of possible advances in crude oil prices and gasoline tank wagon and service station schedules should the U. S. Motor price in Oklahoma be advanced above the 4-cent level.

The high gravity gasolines continue strong. The introduction of an improved regular grade of gasoline at service stations by the Standard of Indiana and other major distributors has brought a demand for a gasoline having an endpoint of from 400 to 410, a gravity above 60 with a low initial and 10 per cent point. Refiners who can furnish this gasoline with an octane rating above 60 have no difficulty in getting from one-fourth to one-half cent more than the U. S. Motor price.

There were a number of inquiries in the market Monday and Tuesday for 64-66 375 and 68-70 350 and 360 endpoint gasolines. One buyer said there were not more than a half dozen refiners in Oklahoma and Kansas who make these grades consistently and only two of these had material to offer for spot shipment. The low quotation on the 64-66 375 was 4⅝ cents for material meeting the specifications of domestic aviation and the sellers of 350 and 360 endpoints were asking a low of 4¾ cents.

Natural Gasoline

Natural gasolines occupied such a strong statistical position the first of the week that several in touch with conditions predicted that the Oklahoma market could easily be advanced above its present level of 4¼ cents and in Texas above 4 cents. Several manufacturers feel that prices should not be advanced until there is additional improvement in refinery gasolines and were continuing to sell at 4¼ cents in Oklahoma and 4 cents in Texas. A few sales were reported at one-eighth above this figure.

Buying has been general in natural gasolines. The movement has been heavy to major refineries located at Gulf Coast points and also to plants in the Chicago area. In addition Mid-Continent refiners have been steady buyers. The supply is steadily increasing from the Oklahoma City and Seminole Fields although the production in these areas has not yet reached the totals reported previous to the shut down in July.

Kerosene and Furnace Oils

The situation in regard to distillates and kerosene has already been explained. Some observers were predicting a temporary slow up in the demand for furnace oils due to the fact that buyers have covered their immediate requirements. Others feel that the upturn will not stop until the better grades of furnace oil reached 2 cents and 41-43 water white kerosene 2¼ cents.

Fuels

The situation in the fuel oil market is a reflection of changed conditions in Mid-Continent refinery operations. A few years ago a buyer had little difficulty in buying any grade of fuel oil desired regardless of specifications. If the refiner did not make the grade regularly he was usually willing to change his plant operations to make the necessary cut.

Now, the great bulk of the fuel oil output in the Mid-Continent is a low gravity residuum from the cracking and reducing operations suitable only for industrial and public utility consumption. The production of the higher gravities is largely confined to a few small skimming plants and much of this material is too high in cold test for use as fuel in northern states.

The low gravity fuels are unchanged in price although the supply and demand is more in balance than it was during the summer months. Buyers said that the low cold test, high gravity grades were practically unobtainable the first of the week. Sales of 28-30 fuel of 20 to 30 cold test at 50 cents were reported and lower cold test brought 55 cents for local movement.

U.G.I. gas oil advanced to a low of 1⅝ cents with scattered sales at 1½ cents.

Late Fields

(Continued from Page 24)

of which are believed to be commercial showings. It is expected to be several days before the casing has been cemented and it will be shut down 10 days more waiting for the cement to set.

J. L. Dixon and others' No. 1 McDuffie, SW cor. SE, Section 3-7s-6, in the Kingston area of Marshall County, found an oil sand that is estimated at 15 bbls. a day from sand at 791-800 feet. Another showing of oil was found in sand topped at 1,065 feet. The operators will drill through the sand before making a production test. It is a wildcat test several miles from any oil production.

New wells completed in the Oklahoma City Field were: Spring Rose Drilling Co.'s No. 1 Henry, SE cor. NW, Section 2-11-3w, which made 660 bbls. of oil in two and one-half hours and 125,000,000 feet of gas a day. The total depth of the well is 6,367 feet. Wilcox Oil & Gas Co.'s No. 1 Lane, NE cor. NW NW, Section 10-11-3w, flowed 5,649 bbls. of oil on its initial four-hour flow. The gas flow was estimated at 12,000,000 feet a day. The Wilcox sand was found from 6,335-6,551 feet. The well is the eight hundred and fortieth producer completed in the Oklahoma City Field.

Phillips Petroleum Co. and Shell Petroleum Corp.'s No. 1 Egermier, SW cor., Section 22-11-3w, which extended production a half mile west on the west side of the field, was given a potential test and flowed 4,287 bbls. of oil in 3 hours and 32 minutes. It was given a potential of 25,726 bbls. in 24 hours. When completed several months ago the well flowed 1,837 bbls. of oil in 2 hours and 15 minutes. Four tests are drilling offsetting the well.

Twelve wells were given their potential tests by the commanding officer in the Oklahoma City Field during the past two days. The wells completing their initial tests were:

Company and well—	Potential (bbls.)
I. T. I. O.'s No. 1 Mount Vernon	1,867
I. T. I. O.'s No. 4 Coppinger	2,515
I. T. I. O.'s No. 1 Mackey	188
I. T. I. O.'s No. 9 Emerson	4,621
I. T. I. O.'s No. 4 Corff	934
Champlin's No. 1 Seal	1,784
Champlin's No. 1 Central	2,262
Anderson-Kerr's No. 1 Damboid	32,792
Wilcox's No. 1 Haynes	15,246
Marco's No. 1 Holder	1,622
Phillips' No. 1 Egermier	25,762
Dangail's No. 1 Ransom	14,884

KANSAS

At a meeting of operators and representatives of the Kansas Public Service Commission, held in Wichita, October 20, it was decided to take new potentials in the Ritz-Canton Pool, in McPherson County, of the chat wells November 1 and the Viola lime wells December 1. During the month of November the commission may increase the allowable of the pool to 20 per cent of the potential. The Abilene Oil Co. asked the commission's permission to make up its underproduction, but nothing definite was decided at the meeting. The company stated in its petition that it had a market for double its allowable production and requested the allowable of the pool be doubled.

The rated potential production of the Schurr Pool, in Rice County, from the 11 completed wells was 8,291 bbls. after a pumping test which was completed Monday. The rated potential of the last three wells was as follows: Slick, Pryor & Lockhart's No. 2 Schurr, 1,062 bbls.; Vickers Petroleum Co.'s No. 3 Binger, 100 bbls.; Producers & Refiners Corp.'s No. 2 Thompson, 981 bbls.

The fifty-second Viola well was completed in the Ritz-Canton Pool, in McPherson County, during the week. It was Mid-Kansas Oil & Gas Co.'s No. 2 Unruh, SW cor. Section 25-19-1w. Oil rose 3,000 feet in the hole from the Viola lime found at 3,366 feet.

In the Decker gas area of the Ritz-Canton Pool, the forty-first gas well was completed during the week, giving the field a total of 162 wells. A total of 69 chat producing wells has been completed. The gas well was Stearns-Streeter Co.'s No. 2 Chindberg, C NW NW Section 15-19-2w, and is estimated at 5,000,000 feet a day from the chat at 2,932-46 feet.

In the southern part of the field the Plains Oil Co.'s No. 2 Unruh, SW cor. NW NE Section 6-20-1w, found a showing of oil in the chat at 2,944-59 feet. The owners expect to drill the test to the Viola lime, as it offsets a Viola producer to the north.

Another location was announced in Ellsworth County on what is believed to be the Ellsworth Arch. Barnsdall Oil Co. and E. V. Shawver's No. 1 Schocht, SE cor. NW SW Section 25-16-10w.

Gypsy Oil Co.'s No. 1 Weiland, SE cor. Section 36-12-16w, Ellis County, was drilled deeper and increased its production to 248 bbls. a day from the Oswego lime at 2,972-73 feet.

SOUTHWEST TEXAS

SAN ANTONIO, Tex., Oct. 20.—Buchanan and Lefevre's No. 1 Ray, over a half mile southwest of production in the new Pettus Pool, started flowing Sunday afternoon and is estimated at 1,000 bbls. It is now flowing by heads when agitated by swabbing.

FATALLY POISONED

Mr. and Mrs. A. B. Alsbaugh of Amarillo, Tex., the former division superintendent of the Prairie Oil & Gas Co. in the Panhandle Field, were poisoned by impure food in Borger, Tex. They were rushed to an Amarillo hospital, where Mrs. Alsbaugh died on Monday and her husband's life was despaired of. A telegram received at company headquarters in Tulsa on Tuesday said Mr. Alsbaugh's death was expected momentarily.

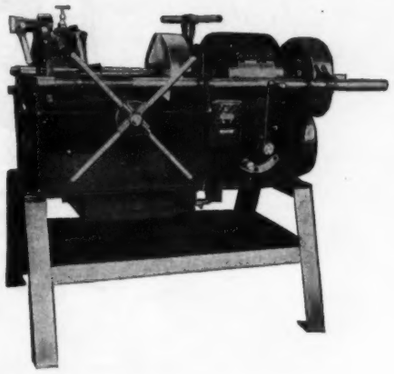
Executive Coercion Challenges Democracy Says Chief Justice

WASHINGTON, D. C., Oct. 19.—In view of the various instances where governors have resorted to martial law recently much interest is being shown here in the concluding portion of the address delivered by Chief Justice Hughes at the unveiling of the bust of James Madison in the state capitol at Richmond, Va. the chief justice said:

"The problem of securing a just and efficient government is far more difficult today than when Madison made these observations. It is the irony of the present situation, that in the hour of the apparent triumph of democracy, when the rule of peoples instead of monarchs was thought to have been made secure, there should be the most serious challenge of democratic ideals. The challenge is more fundamental than one to the particular forms of Democratic or Republican institutions. It is a challenge to the efficiency, wisdom and justice of popular rule carried on through the instrumentalities of responsible legislators and administrators. Whether the attack is in the interest of the state conceived as the protector of the social interests of all the people, or it is motivated by class consciousness in a particular interest, there is common ground in denying the capacity of the people to make laws and to execute them through representatives freely chosen without dictatorship. For the delays and ineptitude of parliaments it is sought to substitute the promptitude and vigor of executive power, and self-constituted authorities assume the responsibility of supplying the intelligence which government by the people is said to lack.

"The challenge is not simply to the democratic principle with respect to the source of authority in government, but to the ideals of liberty. For the alternative to democratic institutions is found in despotic power, whether or not exercised with benevolent intent. The final questions are the extent to which governmental coercion is to be permitted to proceed and who is to be allowed to exert it. It was the ideal of the fathers that our government should be representative and responsible; that our institutions should provide unity and stability, with the limitation of national power to appropriate national ends and with the circumscribing of both federal and state authority in order that a fair freedom of individual opportunity might be preserved. There is no indication that we desire to abandon this system in favor of any form of autocracy, whether contrived to promote efficiency or to establish class rule. With all the imperfections of our institutions we have not yielded to despair. We desire to foster our collective interests, but we have not yet been persuaded that we should be the gainers in the end either by subordinating all individual concerns to the wholly uncontrolled will of the majority or by submitting to any sort of dictatorship.

"We cannot fail to realize, however, that our governmental system is most complex. It makes extraordinary demands upon intelligent political activity and upon capacity for self-restraint. We cannot save ourselves by worshipping the forms of our institutions if we fail to make them serve our just interests. Success in solving our problems lies in a wise application of Madison's controlling principle of the maintenance of a strong national government together with the essential authority of the states over their local affairs, and with constant respect for those individual rights which experience and conscience teach us should be inviolable. It was pre-eminently the political genius of Madison which has given us opportunity, and we shall profit in our use of it to the extent that we emulate his example in making reason, and not emotion, our guide. We need leadership in thought even more than leadership in action."



"TOLEDO" No. 1-2-4
1" TO 4" PIPE MACHINE

NET PRICE . . . $1400.00
F. O. B. TOLEDO, OHIO

DISTINCTIVE FEATURES

1. Steel construction. **2.** Separate adjustable quick-opening die heads for each size pipe. **3.** Same die heads can be used for right or left hand threads. Left hand dies can be furnished on order at additional price. **4.** Rake-type high speed steel chasers. **5.** Low die replacement cost. **6.** Four double edge, high speed steel cutter knives cut simultaneously. **7.** Six spindle speeds obtained instantly through one clutch lever and gear shift lever. **8.** All gears and friction clutch run in oil. **9.** Extra large chip pan and oil reservoir. **10.** Round ways for carriage travel. **11.** Chuck wrench ejector fingers. **12.** Low center of gravity. **13.** All controls easily managed by right hand. **14.** Centrifugal oil pump. **15.** Multiple disc friction clutch. **16.** Electrical reverse. **17.** Short nipples without nipple chuck. **18.** Rear chuck with step jaws for gripping flanges and pipe tongs supports for screwing up flanges. **19.** Adjustabe pipe support with each "TOLEDO" No. 1-2-4. Write us for further information.

THE TOLEDO PIPE THREADING MACHINE CO., TOLEDO, OHIO

"TOLEDO"
MECHANICALLY PERFECT

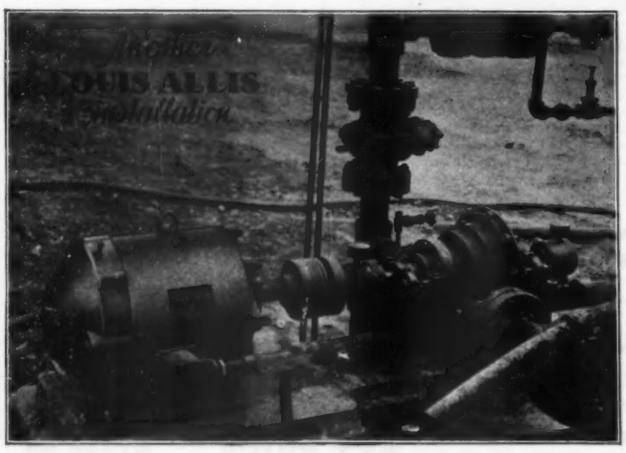
KENNEDY
VALVES~PIPE FITTINGS~FIRE HYDRANTS

WHEN you buy malleable iron pipe fittings with the K-V trade mark, you are sure of quick pipe fitting jobs that will be accurately aligned and permanently tight. Kennedy Fittings are made of truly malleable metal, sturdily proportioned, and with deep, clean, true threads. They protect you against leaky connections, split fittings, and loss of time in connecting up pipe lines.

Send for Catalog

THE KENNEDY VALVE MFG. CO., ELMIRA, N.Y.

New York Chicago San Francisco Philadelphia Cleveland
Atlanta El Paso Los Angeles Seattle



Outdoors, too . . . Louis Allis "Explosion-Proof" Motors are *needed* and *used!*

Here is one of seven motorized pumps handling hot gasoline from the stabilizers at a large natural gasoline plant near Seminole, Oklahoma.

Although installed out-of-doors, the driving motors are frequently surrounded by explosive vapors from the pumps . . . because gasoline vapors, being heavier than air, cling to the ground.

Consequently, Louis Allis Type E "Explosion-Proof" motors were selected . . . to protect this modern plant from the fire hazard which exists wherever non-approved motors operate in explosive atmospheres.

With L.A. "Explosion-Proof" motors and starters, you are not *guessing* at safety. Your *assurance* is the fact that these motors and starters are definitely tested and approved by Underwriters' Laboratories for Class I. explosive atmospheres where petroleum vapors may occur.

Be on the safe side! Follow the leaders! Standardize on

LOUIS ALLIS

Companion Pioneers

The *First* "Explosion-Proof" Fan-Cooled Motor

The *First* "Explosion-Proof" Air-Break Starter

THE LOUIS ALLIS COMPANY
Milwaukee, Wis.

Sales Offices: Tulsa, Houston, Shreveport, St. Louis, Chicago, Detroit, Cleveland, Pittsburgh, New York, Philadelphia, Boston, Buffalo, Los Angeles, San Francisco . . . and other principal cities.

FORTY FIELDS PRODUCED HALF THE OIL SUPPLY

(Continued from Page 16)

Counties, Oklahoma, was opened in May, 1920, by the Marland Oil Co. In 11 years it has produced 177,516,641 bbls. The discovery well was drilled on a lease purchased by the Marland Oil Co. at an auction sale of wildcat leases on the the Osage Indian Reservation. The Marland company paid $2,000 for the 160 acres at the November 11 sale in 1918. Other buyers paid as low as $500 for quarter sections at the same sale, but following the discovery of oil and the development of the leases that were bought when the area was in the "rank wildcat" category, the prices of leases went up until at one sale they hit the $1,000,000 mark and later $1,990,000 was paid by the Midland Oil Co. for 160 acres, an average of over $14,000 per acre. Twenty-one leases, each of 160 acres, brought $28,946,000 at auction before there had been a barrel of oil produced on any of them, an average of $8,615 per acre for undrilled acreage. Notwithstanding the high prices, many of these expensive properties made money for their owners, but some of them never paid out and never will pay out. On the other hand, all the low-priced acreage ranging from $300 up to $1,300 per quarter section, and averaging $4.42 per acre, paid fortunes to their lucky owners. Burbank oil is a very desirable crude of high lubricating content. The oil is a green-black in color, between 37 and 38 degrees in gravity and of intermediate base.

Greatest High-Grade Oil Output

The Seminole Field is made up of 12 pools known as Seminole City, East Seminole, Searight, Bowlegs, Little River, East Little River, Earlsboro, South Earlsboro, East Earlsboro, Mission, Maud and Carr City. The pools lie in Seminole and Pottawatomie Counties, Oklahoma, and are mostly very close together. The discovery well was drilled by the Indian Territory Illuminating Oil Co. in the spring of 1925 in the Seminole City Pool. This well found production in the Hunton limestone. In July of the same year the Independent Oil & Gas Co. and Robert Garland drilled deeper and opened the big production in the Wilcox sand. This led to a widespread wildcatting campaign which soon opened the other named pools and the St. Louis Pool, which latter is not regarded as a part of the Seminole Field, although it is as much a part of the development as any of the others. Seminole Field, together with St. Louis, had turned out nearly 509,000,000 bbls. of oil up to the middle of this year and all the pools have been curtailed almost continuously since 1926. It is estimated that the 12 Seminole pools and St. Louis would be good for 200,000 bbls. a day for a short period if opened up to unrestricted production

Oklahoma City Greatly Restricted

The Oklahoma City Field in Oklahoma County, Oklahoma, has been under curb almost since it was discovered in December, 1928, by the Indian Territory Illuminating Oil Co. Few fields in the United States have been held back as this field has been. Its production of 67,960,925 bbls. in two and a half years is a fraction of what it could have done if the field had been permitted to produce in the old-fashioned way of opening it wide. Eventually it will be among the greatest producing areas in the country. Three oil and gas pays have been developed in the field and its boundaries have not yet been defined.

The Glenn Pool

The Glenn Pool, including the scattered production lying in Townships 18-11, 18-12, 17-11 and 17-12 in Tulsa and Creek Counties in Oklahoma, had produced 195,825,173 bbls. from early in 1906 up to June 30, 1931. The field was opened in the fall of 1905 with a well on the Ida Glenn farm, drilled by Galbreath & Chesley. This well was shut in until the following spring, and when opened produced about 50 bbls. per day. The discovery was followed by an intense drilling campaign which brought production up to a peak said to have been 130,000 bbls. per day in 1907. The oil came from the Glenn sand, later found to be the Bartlesville sand, the top of which lay at about 1,500 feet in depth. In the four townships oil was later developed here and there in several other sands from Red Fork down to Wilcox. The area is now producing about 6,000 bbls. per day after over 25 years of development work. The oil is from brown to black in color, average gravity 32.1 degrees, and with an intermediate base. Its peak production was the highest on record among the high-gravity oil fields of the United States up to the later discovery of the Cushing Field.

Cushing-Shamrock Field

The Cushing-Shamrock Field in western Creek County occupies parts of three townships, 19-7, 18-7 and 17-7. Slick & Jones opened the field in 1912 with a well on the Jones farm in Section 32-18-7 at about 2,200 feet. The Prairie Oil & Gas Co. drilled to the deeper Bartlesville sand and opened the big production on the Tucker farm in Section 3-17-7, and in April, 1915 the field reached its peak, estimated at 330,000 bbls. a day, which fell off rapidly thereafter. The field has produced from several sands down to and including the Wilcox sand. The oil is dark green in color and averages 37 degrees in gravity, some of it being as high as 41 degrees. It has an intermediate base. The field after 19 years of development is producing about 12,000 bbls. per day. Little drilling has been done in a number of years, an occasional deep test in recent years having failed to uncover any new production of importance. The Cushing Field stood for years as the field of highest peak production among the high-grade pools of the country. The pay sands lay at depths from 1,450 feet down to 2,750 feet.

The Slick & Jones discovery well in the Cushing-Shamrock Field in which it is said C. B. Shaffer had a large financial interest, was located 20 miles from the nearest production, which was in Section 10-20-8, Pawnee County. The Oil & Gas Journal's field correspondent at that time, in his account of the discovery in the issue of March 21, 1912, related how Slick & Jones had "sewed up" all the surrounding acreage and had succeeded in keeping others out of the field by renting all the livery rigs in the town of Cushing and contracting for the exclusive services of every notary public in the town. This delayed other lease hunters from getting to the field, and those who were lucky enough to get there and obtain signatures found it impossible to obtain acknowledgments before a notary in Cushing.

Nine Sands in Tonkawa

The Tonkawa Field, located in Noble and Kay Counties, Oklahoma, was opened by the drilling of a well that later proved to have been located on the very edge of production. A northwest offset to the discovery well was dry in all sands. The Cosden Oil & Gas Co. and Marland Oil Co. completed the discovery well in Section 16-24-1w in the Tonkawa sand at 2,658 feet. Later nine sands producing either oil or gas or both were developed in this field, the deepest being the Wilcox sand at 4,065 feet, discovered in a test of T. B. Slick and the Comar Oil Co. The oil from the Tonkawa Field is of high gravity, averaging 43 degrees. It is a green oil of intermediate base. Wells as high as 10,000 bbls. per day were drilled in the Tonkawa Field.

Great Shallow Field

The Healdton Field in Carter County, Oklahoma, was opened in 1913 through the efforts of Roy Johnson, Wirt Franklin, J. M. Critchlow and Edward Galt, who pooled their wildcat lease holdings and finances for the exploration of the area and brought in a 100-bbl. well at 919 feet. Later drilling uncovered either gas or oil pays all the way from 685 feet to 3,500 feet and some very large wells were completed. Sands of Permian, Pennsylvanian and Ordivician age were developed. The oil is brown-black in color, averages 31 degrees in gravity and has an intermediate base.

Mexia and Powell

The Mexia and the Powell Fields, the first in Limestone County and the second in Navarro County, East Central Texas, are fault-line fields. Mexia was opened

by Col. A. E. Humphreys and his associates in 1921 and the Powell Field was opened by a group of Corsicana men who had the bad luck to drill their well at the extreme northerly edge of the structure, getting a good well that soon went to water. They opened a fortune for others while not benefiting greatly themselves. Both fields were small in area, but Mexia up to June 30 of this year produced 27,900 bbls. per acre and Powell 36,756 bbls. per acre.

Burkburnett Badly Developed

The Burkburnett Field in Wichita County, Texas, was drilled mostly by operators new in the business, intent only on getting as much oil each day as could possibly be squeezed out of it. The result of this uneconomical mode of operating was to reduce the volume of its ultimate recovery. Notwithstanding the fact that the field was badly mismanaged, it has produced 137,713,414 bbls. of high-grade crude oil. Burkburnett was a horrible example of how not to develop a field. The lesson it taught might well be learned by some of the ambitious amateur oil men who have come into the East Texas Field intent only on recovering a big flush production regardless of later consequences.

Yates a Wonder Pool

On the western side of Texas are three big fields, Yates, in Pecos County; Church-Fields-McElroy in Crane and Upton Counties and the Hendrick Pool in Winkler County. It had been a general opinion for many years that the days of big shallow sand fields were things of the past; that every shallow sand field had been discovered and developed. To the amazement of all, the Transcontinental Oil Co. and Mid-Kansas Oil & Gas Co., drilling a wildcat on the immense Yates ranch, opened a tremendous gusher well at less than 1,000 feet, and in a thick body of sand. The geologists who had worked the structure had no idea that the pay would lie at any such shallow depth. Wells with an initial production of from 1,000 to 10,000 bbls. in an hour were drilled. None of the wells was permitted to flow any longer than an hour or so because of their tremendous output. The field has never been permitted to produce as much as 150,000 bbls. a day and is yet only partly drilled up. Deeper sands were developed in later drilling. Yates is one of the wonder fields of the world, but the fact that it was owned by large and conservative oil companies has kept the production down to actual demand.

The Church-Fields-McElroy Field, made up of several pools, had its premiere in the well of Church & Fields in Crane County in March, 1926. The Gulf Production Co. owns the greatest acreage in the McElroy Pool, much of which it is saving for future development, although it is known definitely that it is rich in oil. The field has never produced to its capacity and is good for many years of production even though it has produced in excess of 87,000,000 bbls. at the rate of 11,840 bbls. per acre.

Hendrick a Surprise

The Hendrick Pool was one of the greatest surprises in the history of oil in Texas. Geologists condemned the area absolutely and when Westbrook and others started a well on the Hendrick ranch little was thought of it, the test being regarded as a foolish expenditure of good money. The well opened a field that has produced 146,916,652 bbls. in five years most of the time under curtailment. While the oil averages only 30 degrees in gravity it is an excellent crude for cracking stock and turns out a gasoline high in antiknock qualities. It was this field that led to the large drilling campaign in Lea County, New Mexico, which resulted in the opening of the Hobbs Pool which has been held down to a maximum production of 37,000 bbls. because of the water menace, which also affected the Hendrick Pool and made it necessary to keep oil production under control in order to control the water.

El Dorado-Augusta

A multitude of pools make up the El Dorado-Augusta Field in Butler County, Kansas. The field was opened near Augusta by a test that was drilling for gas. Most of the acreage that had been leased in the county was owned by the Henry L. Doherty gas interests. The discovery of oil in 1916 started a tremendous drilling development led by the Empire Gas & Fuel Co., a Doherty subsidiary. In May, 1917, the Trapshooter Oil Co. drilled a well on a shooting grounds near the town of Towanda, west of El Dorado and a 20,000-bbl. well was the result. This well was on the edge of the pool, which became known as the Towanda Pool, and through lack of knowledge of how to handle salt water intrusion the big gusher was soon drowned out. Not far from it a number of very large wells were completed, the greatest being one on the Shumway farm in Section 11-26-4, owned by the Gypsy Oil Co., which started at an estimated 20,000 bbls. per day and produced 2,225,000 bbls. of oil before it quit. On the day the production ceased the well was flowing at the rate of several thousand bbls. per day. The Towanda Pool was the richest spot in the county. The El Dorado-Augusta Field had produced 240,611,201 bbls. up to June 30 and was producing 21,500 bbls. per day on that date.

Salt Creek Carefully Developed

The Salt Creek Field in Natrona County, Wyoming, is another example of a carefully developed field. While the Shannon Pool was opened in 1889 and the larger development of what became known as the Salt Creek Field was opened in 1908 it was not until 1911 that the field produced enough to make it worthy of record. It has been carefully drilled, only enough oil being taken out of it to fill local refinery requirements. It has produced 232,161,783 bbls. up to June 30, 1931, or during a period of 20 years, and is still one of the major fields. The oil is green in color, of paraffin base, with a weighted average gravity of 36 degrees.

The Caddo Field

The discovery well of the Caddo Field, completed in May, 1904, was drilled by Savage, Morrical & Savage on the Offenhauser land in Section 1-20-16, near Oil City, about 25 miles northwest of Shreveport, La. The initial production of the well was 15 bbls. daily from 1,556 feet. Further development of the field did not materialize until December, 1906, when extensive drilling was started.

From the discovery area the field was gradually extended north and south, covering practically all of Townships 20 and 21 in Range 16, making this area about 12 miles long and from 6 to 8 miles wide. From the northern extremity of Township 21 in Range 16, production turned northeast near the town of Vivian and was extended to the Houston Field, forming a half-moon or crescent shape of over 20 miles in length. The Caddo Field covers a series of pools, opened up at different periods, some of which are Mooringsport, Oil City, Vivian, Trees City, Pine Island, Hosston and Dixie. In the development of the field, production extended into Caddo Lake, which is from 10 to 40 feet deep, and this water area still furnishes many good pumpers of high gravity oil, the gaugers and pumpers going to and from their work in boats.

Production comes from several horizons, from 1,050 to 2,300 feet in most of the pools. However, Pine Island has uncovered deeper paying strata, the Glen Rose formation producing in this field from around 2,700 feet, and the Trinity from 3,800 to 4,000 feet. The latter producing horizon was discovered about two years ago in the Pine Island Field, but exploration for it has not been pushed and future developments will reveal the potential of this deeper production.

Smackover's High Peak

Smackover in southern Arkansas is a field of light and heavy crude, with the heavy oil predominating. It was opened in 1922. Three years later when the field was rapidly on the down grade a third oil pay was opened up by the Lion Oil & Refining Co. and a greater production than ever resulted. The field scored a peak production of 444,960 bbls. per day as an average for the week ending May 30, 1925. Of this 415,185 bbls. was heavy oil, or crude 24 degrees gravity and under. Many tests to open up a fourth oil pay were unsuccessful. Smackover came

FREE!

Now Ready New TAG Catalog

FLOW INSTRUMENTS

Completely describes and illustrates the full line of TAG Flow Instruments which comprises: Flow Recorder-Controllers for Liquids, Flow Meters and Orifice Meters for Gases, Flow Recorder-Controllers for Gases and Liquid Level Recorder-Controllers.

In addition it's full of photographs and diagrams of applications which make it far more than a mere compilation of uninteresting facts and figures.

Mail the coupon NOW for your copy!

C. J. TAGLIABUE MFG. COMPANY
Park & Nostrand Aves.
Brooklyn, N. Y.

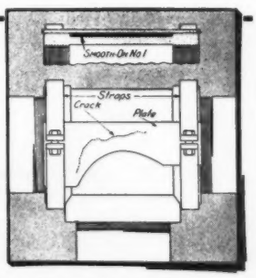
C. J. TAGliabue Mfg. Co., Park & Nostrand Aves., Brooklyn, N. Y.

Gentlemen:
Please send me the New TAG Flow Instruments Catalog No. 1020-50.

Name .....
Address .....

50 CTS. for SMOOTH-ON No. 1 easily saved $50.00

for labor and material on this repair—and avoided a much heavier loss from prolonged shutdown



WHEN this 4-in. cast-iron tee cracked in a branch steam line in a Western cement plant, the Engineer had exercised the good judgment of having a supply of Smooth-On No. 1 ready for emergencies. He cleaned the crack, tamped in Smooth-On No. 1, plastered more on the outside, made a plate held in place by two straps and drew this up with bolts to force the Smooth-On into the crack. With only a 65-minute shutdown, the line was back into service. Three years later this repair was still in place and tight as ever. The use of Smooth-On had avoided an expensive overtime job for the Engineer and saved the Company from the heavy loss of a more extended shut-down.

Smooth-On No. 1 has often saved several thousand dollars on a single emergency job, and savings of $50.00 to $100.00 are common.

With a stock of Smooth-On No. 1 in your store room and a copy of the Smooth-On Handbook on your desk, you are always ready for leaks at pipe threads, flanges, open seams, cracks, etc. Take this tip now and you will have less worry when the hurry call comes.

Mail Coupon for the SMOOTH-ON HANDBOOK

SMOOTH-ON MFG. CO., Dept. 66,
570 Communipaw Ave., Jersey City, N. J.
Please send Smooth-On Handbook.
Name .....
Address .....
10-22-31

Get SMOOTH-ON No. 1 in 1 or 5-lb. cans, or 25 or 100-lb. kegs from your nearest dealer, or, if necessary, from us.

Do it with SMOOTH-ON

THE FULTON THROTTLING REGULATOR

The Fulton Throttling Regulator maintains a constant pressure under varying conditions of load.

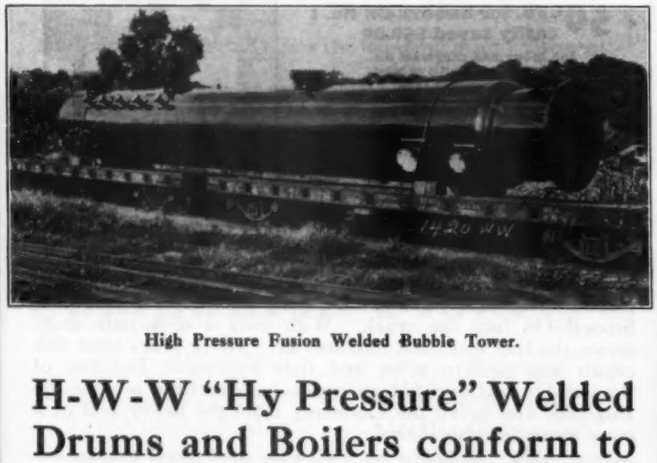
The Regulator is placed in the suction line to the compressor and is controlled by the pressure at the discharge acting on the diaphragm surface, which is balanced by weight on the lever.

A tendency of the discharge pressure to rise overbalances the weight on the lever and the valve moves toward its seat, throttling the suction sufficiently to restore and maintain the discharge pressure at a fixed point.

THE CHAPLIN-FULTON MFG. CO.

Manufacturers of Regulators for Industrial Gas Service

28-40 Penn Ave., Pittsburgh, Pa.



High Pressure Fusion Welded Bubble Tower.

H-W-W "Hy Pressure" Welded Drums and Boilers conform to ASME CODE. Welded Seams are X-RAYED. Drums are furnace annealed. Integrity of Weld commends these vessels where requirements are exacting.

THE HEDGES-WALSH-WEIDNER CO.

CHATTANOOGA, TENN.

Mayo Bldg., Tulsa 200 Madison Ave., New York

at a time when "heavy" oil was regarded as good only for fuel purposes. Later it was developed that 40 per cent and more gasoline of high antiknock quality could be recovered by cracking heavy Smackover crude. Smackover continues to rank among the major fields of the country but it has long since been completely drilled up.

Spindletop a Salt Dome Field

Spindletop, the greatest as well as oldest and most prolific producer of the salt dome fields of the Gulf Coast, was opened on January 10, 1901, when A. F. Lucas' No. 1 Gladys, commonly known as the Lucas gusher, blew in estimated variously from 75,000 to 100,000 bbls. daily from the cap rock at approximately 1,140 feet. Until the year 1926, when the first flank sand well was brought in, all production at Spindletop was confined to the small cap rock area and shallow sands immediately overlying the dome, probably one of the most prolific spots for its size the industry ever has known. At the time the first deep well, Yount Lee Oil Co.'s No. 3 McFaddin, located on the south flank of the dome, came in, the days of Spindletop were thought to have been over, but since then a development nearly as great as the first boom has taken place, resulting in the proving up of a thickly drilled strip of production from numerous sands skirting the entire south and west sides of the old shallow field. The field is located just south of the city limits of Beaumont in Jefferson County.

Humble's Small Acreage

Humble, the second largest producer of Gulf Coast oil, was discovered in 1905, when, on January 9, D. R. Beaty's No. 1 fee came in flowing 5,000 bbls. daily from the shallow cap rock. This dome is considerably larger than Spindletop and, although its recovery has not been nearly as great per acre as at Spindletop, total production to date is a close second. Like at Spindletop, the first development and production was all shallow. Flank sand production was discovered in 1914 and in the years 1915 and 1916 Humble was the center of a deep sand development boom, which resulted in deeper and deeper production. That play, however, was only one of several other deep sand discoveries and plays destined to follow in more recent years which have resulted in the proving up of additional prolific pools from deep sands. Following the close of the first deep sand play in 1916, production at Humble declined rapidly and until 1929, when Cullen & West brought in a 4,000-bbl. well in their No. 1 Morris, located approximately a mile to the south of the original shallow field from a new deep sand below 5,000 feet, everyone thought Humble had been completely exploited. The development following that deep well continued well through 1930, proving up a deep pool extending over a mile along the south and southeast side of the dome and causing Humble at that time to climb to the top in the amount of daily production. Before that activity had completely died out, another deep sand pool was uncovered on the west flank of the dome around 3,500 to 4,000 feet, the discovery well being Sun Oil Co.'s No. 3 Bender. At present there is no development under way at Humble. This field is about 20 miles north of Houston.

Sour Lake's History

The discovery of the Sour Lake Field, Hardin County, followed only a year and a half after the bringing in of Spindletop and thus rates being the second oldest of the Gulf Coast's important producers. The discovery well was Sour Lake Oil Co.'s No. 2 fee, completed July 18, 1902, from a depth of approximately 375 feet, flowing 10,000 bbls. daily. Until 1913 all production was from the shallow cap rock, the field reaching its peak on 1903. First flank sand production was found in 1913 but this was comparatively shallow from around 1,200 to 2,000 feet. Later, in 1926 and 1927, deeper flank production was discovered from 3,500 to 4,000 feet, but none of the deep production at Sour Lake has been of any great importance to date, although flank sand possibilities have not been extensively developed. Thus, virtually all the present production of the field is shallow cap rock and shallow sand oil.

Big Wells in West Columbia

Although one of the newer fields of the older coastal domes, its discovery dating only as far back as September 7, 1917, West Columbia, Texas, has been one of the most prolific as well as profitable fields. The extremely profitable feature was due chiefly to the fact that the greatest part of its production was at a time when crude prices were the highest. While first production was found during September, 1917, commercial production was not opened until the following year. The discovery well, Tyndall-Wyoming Oil Co.'s No. 1 Hogg, made only 6 bbls. initial from sand at 2,900 feet. During the ensuing years through 1922 the field yielded nearly 43,000,000 bbls., a figure surpassed only by Spindletop for such a short period. West Columbia is producing chiefly from flank sands on the southwest side of the dome, but there has been some shallow cap rock oil. The field has to its record several wells of industry-wide fame, chief of which has been The Texas Company's No. 1 Abrams, whose initial flow exceeded 30,000 bbls., which no wells, on the coast, except a few of the earlier wells at Spindletop, have equalled. Since that well has produced possibly more oil than any other well on the coast and still is on production.

Record of Goose Creek

Goose Creek, another of the Gulf Coast's greatest fields, is one of the very few where no salt dome has been found to exist. However, in general characteristics the field is identical with salt dome fields and it is assumed that the field overlies a very deeply seated salt mass or else that a dome is in the neighborhood, possibly out in Galveston Bay, the field being at the mouth of Goose Creek and partially in the bed of the bay. Goose Creek, located by the presence of seeps and paraffin dirt, was opened in 1906 by Rucker and associates' No. 2 Gaillard, which had an initial production of less than 1,000 bbls. from a sand around 1,600 feet. Although considerable drilling was done in subsequent years and additional production was obtained in various sands the field did not assume any great proportions until 1916 after the finding of a 10,000-bbl. well in a new sand around 2,030 feet by American Production Co. In the following year and a half Goose Creek received its main growth, reaching its peak in 1918. Commercial production has been developed in numerous sands to below 4,800 feet.

Hull Thoroughly Developed

Hull is one of the most thoroughly developed domes on the coast, having had not only extensive shallow sand and cap rock production overlying the salt but also production in flank sands completely circling the dome and from numerous horizons. The opening of production, however, came only after years of drilling following proving of the existence of the salt mass as early as 1908. The discovery producer was not completed until July 26, 1918. This was Republic Production Co.'s No. 3 fee, a 1,000-bbl. well in a shallow flank sand at 1,200 feet. From that time, however, there has been a steady although not sensational extension of productive area, the opening of additional horizons and the building up of consistent production.

California's Great Fields

The Midway-Sunset Field of Kern County, California, tops the list of America's fields from a cumulative production standpoint, although the average recovery per acre is substantially below that of several other fields in the country. The Midway-Sunset Field consists of several independent structures unlike most other fields in California which have more or less well defined anticlines or productive monoclines. Midway-Sunset was one of the first major oil fields discovered in California.

The Long Beach Field of Los Angeles Basin, California, although only discovered a little more than 10 years ago, has already produced 435,803,554 bbls. of crude oil, as compared with 702,573,177 bbls. for Midway-Sunset in a period extending over approximately 30 years. The Long Beach Field, with 1,650 acres of proven oil land, shows an average recov-

ery of 264,124 bbls. of crude oil per acre. This is the largest production per acre as far as California is concerned and it is generally admitted that Long Beach would be well up toward the top of the list if recovery figures were computed on the basis of all crude oil and wet natural gas brought to the surface.

The Santa Fe Springs Field, discovered by the Union Oil Co. in 1921, has produced more crude oil in this 10-year period than the Coalinga Field of Fresno County, opened up in 1897. The former has produced 318,583,366 bbls. of crude oil to date, as compared with Coalinga's 317,717,005 bbls. Santa Fe Springs, with 1,650 acres of proven oil land, shows an average recovery per acre of 193,081 bbls., while the average at Coalinga from 16,480 acres is 19,279 bbls.

The Kern River Field has produced 284,533,339 bbls. up to June 30, 1931, and shows an average recovery per acre of 35,128 bbls. from a total of 8,100 acres of proven oil land. The oil produced by this field is of a heavy unrefinable quality but an excellent fuel oil because of its high B.t.u. value. During the past year Kern River crude has been mixed with oil from the Fruitvale Field and sold direct to commercial consumers. Crude oil from the Fruitvale Field, which tests approximately 22 degrees A.P.I., is of an inferior grade due both to the lack of lighter fractions and an unusually low heat value. By commingling the two oils, however, viscosity of the Kern River crude is reduced and the mixture results in a fairly favorable fuel oil.

Plenty of Oil to Come

The Huntington Beach Field, opened up by the Standard Oil Co. during the latter part of 1920, has produced 177,302,290 bbls. from 2,250 acres, but it has not been fully developed. This field, which is quite badly faulted in several sections, has intrigued petroleum engineers for several years. The unconformity of subsurface conditions and the rather limited amount of data available due to incomplete records resulting from highly competitive drilling has not been conducive to economic development. During the past year the Superior Oil Co. and W. E. McCaslin have been endeavoring to prove up the existence of a new deep zone in the town lot area paralleling the ocean front, but this exploration work is not yet conclusive.

The Fullerton, or Brea Olinda Field, as it is many times designated, showed its first production in 1897 and has produced 139,089,249 bbls. of crude oil up to the present time. The 1,750 acres of proven oil land shows an average recovery of 79,479 bbls. per acre. This field is closely allied with the career of E. L. Doheny as he achieved unusual success in this area after disposing of his holdings in the San Joaquin Valley. Present productive acreage of the Chanslor-Canfield Midway Oil Co. in the Fullerton Field of Orange County was purchased from Mr. Doheny a number of years ago. The Fullerton Field is not overdeveloped and will should produce at least 50,000,000 bbls. more before production costs become prohibitive.

The Santa Maria and Coyote Fields are on about a par from a production standpoint, the former having produced 126,748,326 bbls. of crude oil, as compared with 126,058,772 bbls. for Coyote. The former field, however, has 8,000 acres of proved oil land, as compared with 2,100 acres for Coyote and a longer production period. The Elk Hills Field of Kern County, discovered by the Standard Oil Co. in 1919, is still ahead of the Ventura Avenue Field from a production standpoint, but the latter field will pass Elk Hills within another year. Elk Hills has 4,879 acres of proven oil land, as compared with 1,750 acres for Ventura Avenue, but the latter has the greatest thickness of oil-bearing formation in California and will consequently show an exceptionally high recovery per acre.

Kettleman Hills Big Future

Kettleman Hills is still only a juvenile as far as production and development are concerned, but this field will probably lead the production list at some future date. The north dome is proven up for a distance of approximately 10 miles long along the axis of the structure and when fully developed may contain 15,000 to 20,000 acres of proven oil land and show an aggregate production in excess of 1,000,000,000 bbls.

The Inglewood Field of Los Angeles Basin, discovered by the Standard Oil Co. in 1924, has only produced 77,223,744 bbls. of crude oil up to the close of June, 1931. This is in excess of 86,000 bbls. per acre, but one should not lose sight of the fact that there are additional deep virgin zones in this field which have not yet been developed but which will substantially increase the ultimate recovery. The Lost Hills-Belridge Fields of Kern County, which consist of three distinct fields separated at six-mile intervals, have produced 62,857,318 bbls. of crude oil up to the present time but, like Inglewood, Dominguez and several other fields, have not reached maximum development. The discovery of Temblor production in the North Belridge Field has greatly increased the ultimate expectation, and if this formation is subsequently found productive at Lost Hills and in the main Belridge Field, total recovery will consequently be increased. The McKittrick Field of Kern County is approximately fully developed and, while it has yielded 81,033,638 bbls. of crude oil up to the present time, it will be a factor of minor consequence in the future unless, of course, deeper zones are subsequently developed.

CENTRAL WEST FIELDS

(Continued from Page 50)

drilling in the same township, but the locations are not known. In Section 3, Harrison Township, J. E. Young is starting No. 1 Floyd Wilson.

Perry County—A test to the Corniferous is planned for the area near Derby where some favorable structural conditions have been found. In Leopold Township, Conyers & Bugg are drilling No. 4 Lee Aders. W. B. Nay abandoned and plugged the J. M. Burton test at 550 feet. No. 1 Ed Cassiday, drilled by Gustave Walters and others in Section 4, Leopold Township, is drilling near the Corniferous at 1,436 feet. The test being drilled by J. H. McClurkin on the A. V. Doogs farm, in the SW, Section 9, Oil Township, is down 250 feet. A. J. Glenn is starting No. 1 on the Joseph F. Glenn land in the SE, Section 12, Tobin Township. No. 1 Louis Grange, in the SW, Section 21, Oil Township, drilled by Roger E. Williams and others, is down 725 feet. Lane and others are down 320 feet on the Lanman farm, 1 mile south of Bristow. They have also reached 1,400 feet near Tobinsport.

Pike County—No. 1 R. M. Craig estate, drilled by C. E. Wommer, in the NW, Section 23, Jefferson Township, was finished dry at 1,125 feet. James E. Young is drilling No. 1 Ben McCord in the SE, Section 23, Washington Township. The first well on the Simon Morgan farm, in the SE, Section 26, Washington Township, was completed by C. E. Wommer, producing 700,000 feet at a depth of 1,150 feet. The Indiana Southwestern Gas Corp. is drilling No. 1 John V. Peed, in the NW, Section 32, Clay Township.

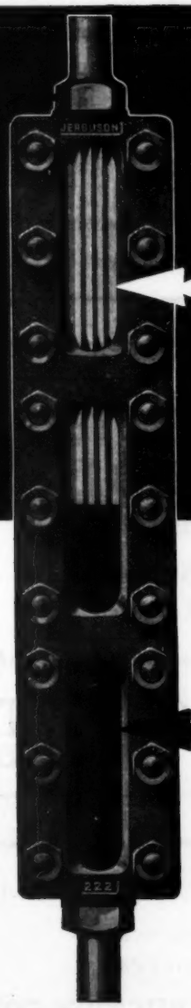
Rush County—C. C. Bundy is drilling a gas well for Thomas E. Innis, in the SW, Section 21, Anderson Township.

St. Joseph County—The Harry Sones well, in Section 29, Harris Township, is shut down at about 1,900 feet.

Spencer County—No. 1 William Grass, drilled by I. A. Polhamus, in the NE, Section 11, Huff Township, was completed a dry hole at 645 feet. A second well on the same farm is down 200 feet. Wayne Gale is down 100 feet in a well on the Grass farm.

Sullivan County—C. W. Scott completed his fifth well on the C. L. Davis farm, in Section 14, Turman Township, with a small production of oil and some water. J. C. Ellis completed a small gas well on the Mary Drake land in Section 29, Curry Township. Following rumors of a good oil showing in the Illinois test across the river, comes a report of a test being planned for the Patton farm near Meron. H. Huntsman is still shut down at about 700 feet in the

This gage shows in *BLACK* and *WHITE*



The EMPTY SPACE shows WHITE

The LIQUID shows BLACK

JERGUSON
REFLEX GAGE

Shows oil level with the full visibility of black on white. Leading oil companies are using it on tanks, towers, stills, etc.

For 25 years these gages have demonstrated safety under highest pressures and temperatures. We furnish them with or without valves for every type of service. Write us for information.

JERGUSON GAGE & VALVE CO.
MYSTIC AVE. AND NORTHERN ARTERY
SOMERVILLE, MASS.

DART UNIONS AND FLANGES

Two Bronze Seats

May we send you sample to try on your most troublesome line? It is absolutely free. Write today for catalogue "O."

E. M. DART MFG. CO., Providence, R. I.

The Fairbanks Co., Distributors

TEXAS ELECTRIC STEEL
SUCKER RODS
HEAT TREATED

10% Greater Tensile Strength
10% to 30% Longer Life

A Complete Line of Oil Field Pumping Equipment

TEXAS STEEL COMPANY
FORT WORTH, TEXAS

QUALITY SPEED RELIABILITY

Pipe Line Contractors
Welding Engineers

SMITH BROTHERS CONSTRUCTION CORP.
(Texas)
KANSAS CITY
OMAHA DALLAS

National Airoil Burners

Oil Burners and Gas Burners for every industrial purpose: Steam atomizing Burners, Motor-driven Rotary Burners, Low Pressure Air Burners, Gas Burners, Combination Gas and Oil Burners, Fuel Oil Pump Sets, Fuel Oil Strainers. Engineering advice, design and supervision of complete oil or gas burning systems for every industrial purpose.
NATIONAL AIROIL BURNER COMPANY
Oil Burners, Gas Burners and Furnace Equipment
Offices and Salesrooms: 1327 Girard Ave.
Factory: S.W. Cor. 9th & Thompson Sts., Philadelphia

HEYDRICK'S NEW MAP
East Texas Field
Accurate and up-to-date.
Scale, 2,000 feet 1 inch.
Cloth $17.50; paper $10; Size 3½x8 feet
HEYDRICK MAPPING COMPANY
Wichita Falls, Texas

PATENTS *Write for Free Book*
MUNN & CO.
Associated since 1846 with the Scientific American
814 Scientific American Bldg., *Washington, D. C.*
1351 Scientific American Building.
24 West 40th Street, *New York City*
1303 Tower Building, *Chicago, Ill.*
686 Hobart Building, *San Francisco, Calif.*
311 Van Nuys Bldg., *Los Angeles, Calif.*

first well on the Catherine Piety lease in Section 7, Turman Township.

Switzerland County—Clarence Carter is having a test well drilled on his lot in Vevay.

Warrick County—The Elberfeld Gas & Oil Co. abandoned its test on the Dooney Coleman farm in the SE, Section 21, Greer Township, at 1,900 feet.

Warning to Operators

Paul F. Simpson, state gas supervisor, has this to report which is of interest to all identified in the oil and gas operations in Indiana:

"The drillers and operators of the State have had sufficient time to familiarize themselves with the new regulations requiring that notices of wells be turned into this office at least five days before work is begun. A few are careless about taking care of this matter in a satisfactory way, and unless they are more prompt in the future, court action will be started against them. Several logs are also due for wells completed more than a month ago. It is also a recognized fact that one or two drillers in the State do not keep accurate logs of their wells as they drill them. These few should realize that not only are they liable to prosecution but that they are hurting their own business by not keeping adequate records. The records of all wells are filed so that they may be used in future geological work, and often the locations of additional wells are dependent on this information. Those who are still delinquent will receive a letter requesting closer co-operation. This office is maintained to co-operate with those who are interested enough in the State's mineral resources to spend their money developing them, but it cannot be of fullest assistance if part of the necessary information is withheld at its origin."

ILLINOIS

No completions were reported from any part of Illinois during the week as most of the wells that have been under way are reported shut down.

KENTUCKY

Completions are few at this time in any part of Kentucky. In Ohio County, S. H. Russell and others found a dry hole in the southeast corner of the S. H. Haynes 173 acres, at a depth of 820 feet. H. L. Ogle and others are drilling No. 1 I. T. Westerfield farm, in the Friendship Pool, same county.

S. A. Cobb and others' No. 3 on the J. P. Howard 106-acre farm, in the Awope Pool, of Daviess County, is said to show around 35 bbls. initial. This is near the Walnut School Gove. No. 4, same farm, is drilling. S. H. Russell and others are drilling on the S. Tanner farm, in the Colyer Pool, same county.

Pipe Line Runs

Total runs made from wells served by the Illinois Pipe Line Co. in western Kentucky during the month of September, were as follows: 129,299.28 bbls.

MICHIGAN

While a large number of wells is being drilled in the Mount Pleasant-Midland-Clare Fields, completions are few on account of the depth to the oil-producing sand, the Dundee formation. The gas-producing sands are the more shallow pays. At this time most of the drilling for oil is centered in Isabella and Midland Counties.

Until 1931 the biggest well in the Mount Pleasant-Midland Field was about a 1,500 barreller, while a few made 700 and 800 bbls. In the past four months big wells have been increasingly numerous. The Struble wildcat was brought in with a heavy flow but because of fire no official check in the initial flow was possible. Estimates ranged from 800 to 1,200 bbls. The Woods farm well in Vernon Township, Isabella County, made approximately 2,500 bbls., and the Purtell well of the Pure Oil Co., in Greendale Township, Midland County, reached a similar mark. In the meantime the Russell farm well in Vernon Township, Isabella County, and several wells in the "New East Pool" were drilled in with flows above the 1,000-bbl. mark, or near it.

The latest big project was the Bernard farm, owned by the Pure Oil Co., in Section 9, Greendale Township, Midland County, in the East Pool and near the Struble and Purtell farm wells. The Bernard well flowed approximately 2,400 bbls. the first 24 hours and fell to less than 2,000 bbls. the second 24-hour gauge. It is one of the best wells in the Isabella-Midland Field but not a record-breaker. So far as can be learned, the wells on the Woods and Purtell farms are the biggest initial production wells in the Isabella-Midland Field, having records of about 2,500 bbls.

Muskegon may lay claim to the biggest well yet found in Michigan. One gauged at the rate of 18,000 bbls. a day for the first 10 or 15 minutes. Others came in at the rate of around 5,000 bbls., but failed to make the rate through the 24-hour check. Many of Muskegon's big wells went dry in a few weeks.

The value of oil wells is not always in a big initial production. Usually the big wells after "blowing off" settle down to average producers. The Bowman well in Vernon which was drilled in two years ago made only about 180 bbls. but it has continued to flow better than 100 bbls. a day since drilled in and can be rated as one of the best payers. There are many instances of small wells through their steady production proving themselves nearly as profitable as the big gushers.

Late Completions

Two oil producers were reported from the Isabella-Midland Field, both being large producers. One was the Pure Oil Co.'s No. 1 Bernard farm, Section 9, Greendale Township, Midland County, in the New East Pool. The estimated production of this well has been given as 2,400 bbls. initial from the Dundee formation. The second completion was the Mellon-Pollock Oil Co.'s No. 1 on the Thayer 120-acre farm, Section 22, Vernon Township, Isabella County, the second largest well in that area and rated at 2,400 bbls., and in the same area as the large Woods farm gusher, which showed 2,500 bbls. initial when completed a few weeks ago. In this East Pool, in Greendale Township, Midland County, two pays are found in the Dundee formation, the second found only a very few feet below the top pay, and some of the wells in the new pool that have not yet drilled to the second pay may drill the extra few feet in hope of increasing the crude output. This second pay was first discovered in the Pure Oil Co.'s No. 1 on the Purtell farm, which is the Pure company's tank farm.

Reports from Ashley, in the southeastern part of Gratiot County, say Millie & Combs have brought in a gas well on the Kerr farm at a depth of 500 feet which gauged 2,022,000 feet. This makes the fourth gas well drilled in the vicinity of Ashley, and many more will be drilled by the farm owners, as it is the cheapest fuel they can find for heat and lights. This shallow gas drilling is becoming quite a fad over the southeastern portion of the State and many shallow wells have been drilled.

A drilling permit has been issued to H. H. Brown of Mount Clemens, Mich., to drill No. 1 on the Gregory Krantz estate, in Macomb County, Chesterfield Township.

Numerous locations are expected to be made for new wells in Clare, Vernon, Broomfield and the new East Pool, in Isabella and Midland Counties.

Field Pickups

The next well due for completion is the Gordon Oil Co.'s No. 3 on the Skinner farm, SE NE NE, Section 16, Greendale Township, Midland County.

Production on the No. 1 on the Job Brief farm, N half SW Section 22, Vernon Township, Isabella County, owned by the Mellon-Pollock Oil Co., has held at about 700 to 800 bbls. daily since the well was drilled in and the Pure Oil Co.'s No. 1 Purtell farm, Section 16, Greendale Township, Midland County, has held an average above 2,000 bbls. a day. These two wells, judged by their steady flows, are regarded as two of the best producers in the field. The Purtell well was drilled in during September and the Brief farm well more than a week ago.

15 to 5000 gallons per minute

Oceans of clean water for refineries, cooling units and for all industrial uses.

Ask for new Bulletin

POMONA PUMP CO., Pomona, Calif.

PUMP MORE WATER PER DOLLAR

Pomona Pumps

Distributors

U. S. Wind Engine & Pump Company
11th and Hickory Sts., Kansas City, Mo.

The Shuler Company
138 West 37th St., Oklahoma City, Okla.

Southern Engine & Pump Company
900-910 St. Charles St., Houston, Texas

MW PRODUCTS for pumping wells

The KEY to LOWER LIFTING COSTS

CORRECTLY DESIGNED ECONOMICALLY PRODUCED REASONABLY PRICED

Admore Liner Barrels

More than just a good liner Barrel

It wins on Price and Performance. A pulsating effect is obtained which keeps the packing alive and active thus making replacements infrequent. Right as to design and materials. Built in a modern plant where production costs are watched carefully. Offered at a price which puts competition away out of range—especially considering the fine performance of ADMORE LINER BARRELS.

A Combination of Qualities that cannot be beaten.

BRADFORD MOTOR WORKS INC.

OIL WELL SUPPLIES

BRADFORD, PA. TULSA, OKLA.

EXPORT OFFICE—30 CHURCH ST.—NEW YORK CITY

PICKERING 1862 · 1931

One Line for 70 Years

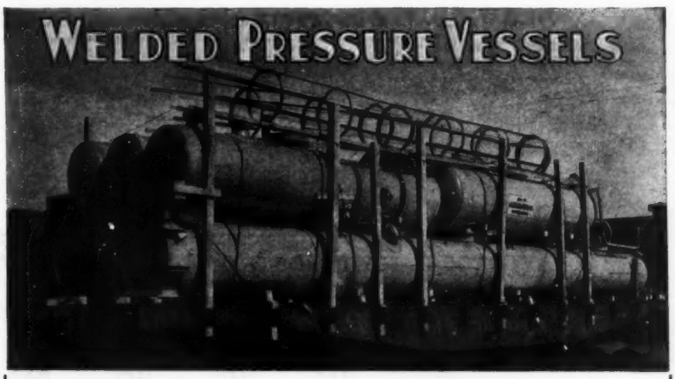
Is it not logical that a concern specializing in the production of Governors wholly for 70 years are Master Craftsmen in their line?

That is our background.

How may we help you?

The Pickering Governor Co.
Portland, Conn.

PICKERING GOVERNORS



SPECIAL PLATE FABRICATION

Welded or Riveted

THE splendid facilities of the Leader organization for all classes of Refinery plate work are fully illustrated and explained in the Bulletin, "Facilities for Special Plate Fabrication."

A copy of this Bulletin will be sent to any Departmental Executive at his request. Send for it and become acquainted with the scope of Leader facilities

LEADER IRON WORKS, INC.

2130 NO. JASPER ST. DECATUR, ILLINOIS

Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Statement for August

Runs

	Month (bbls.)	Dy. av. (bbls.)
Prairie P. L. Co.*	530,100	17,100
Gulf P. L. Co.	1,184,912	38,223
Texas P. L. Co.	424,977	13,709
Magnolia P. L. Co.	1,376,606	44,407
Empire P. L. Co.	1,303,455	42,047
Cosden P. L. Co.	584,860	18,866
Stanolind P. L. Co.*	1,556,200	50,200
Oklahoma P. L. Co.	1,987,099	64,100
Other lines	4,050,119	130,649
Total August	13,029,328	419,301
Total July	12,663,548	631,081
Difference	6,534,220	211,780

Shipments

Prairie P. L. Co.	3,413,613	110,117
Gulf P. L. Co.	1,621,578	52,309
Texas P. L. Co.	768,064	24,776
Magnolia P. L. Co.	1,312,642	42,342
Empire P. L. Co.	2,041,816	65,865
Cosden P. L. Co.	724,574	23,373
Stanolind P. L. Co.	3,672,415	118,465
Oklahoma P. L. Co.	2,957,638	95,408
Other lines*	6,758,000	218,000
Total August	23,270,345	750,656
Total July	23,149,053	746,743
Difference	121,312	3,913

Stocks

Prairie O. & G. Co.*	36,523,000
Gulf P. L. and Gypsy Oil Co.	5,658,769
The Texas Company	3,430,631
Magnolia Petroleum Co.	6,689,208
Empire P. L. Co.	4,082,253
Mid-Continent Petroleum Corp.	3,494,511
Stanolind Crude Oil Pur. Co.*	16,831,600
Oklahoma P. L. Co.	1,203,189
Carter Oil Co.	7,889,875
Other lines*	16,624,839
Total August	105,427,880
Total July	111,096,680
Difference	5,668,800

*Estimated.

EASTERN PIPE LINE REPORT FOR MONTH OF AUGUST

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for July and August:

	July, 1931	Aug., 1931
Nat. Transit	133,220.85	121,756.52
S. W. Pa. P. L.	71,451.01	64,160.09
Eureka P. L.	289,307.41	274,288.96
Buckeye P. L. (Macksburg)	243,334.42	225,597.43
Buckeye P. L. (Cleveland)	11,493.40	11,149.05
Buckeye P. L. (Lima, etc.)	86,516.97	70,669.93
Indiana P. L.	2,402.03	2,600.03
Cumberland P. L.	164,965.59	146,239.07
N. Y. Transit	25,816.95	24,817.39
Tidewater P. L.	25,578.82	23,863.07
Pure Oil	184,069.34	217,534.36
Stoll Oil Ref.	46,439.49	58,042.70
Bradford Transit	334,264.05	353,931.05
Total	1,618,910.93	1,596,596.16
Daily average	53,963.70	51,503.10

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for July and August:

	July, 1931	Aug., 1931
Nat. Transit	545,129.48	672,837.36
S. W. Pa. P. L.	444,267.19	470,477.88
Eureka P. L.	389,088.42	402,173.50
Buckeye P. L. (Macksburg)	242,021.51	209,652.58
Buckeye P. L. (Cleveland)	1,950.38	2,191.00
Buckeye P. L. (Lima, etc.)	1,906,783.85	1,965,906.80
Indiana P. L.	976,959.98	1,146,141.55
Cumberland P. L.	115,573.69	97,247.87
Southern P. L.	71,576.50	67,327.53
N. Y. Transit	173,789.42	184,459.52
Northern P. L.	181,895.41	194,192.95
Tidewater P. L.	402,796.82	557,362.79
Pure Oil	189,036.80	222,792.33
Bradford Transit	452,852.88	365,531.31
Tuscarora Dev.	436,907.19	479,354.03
Total	6,560,609.33	6,949,150.80
Daily average	211,632.56	224,166.16

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of July and August:

	July, 1931	Aug. 1931
Nat. Transit	657,462.03	709,462.64
S. W. Pa. P. L.	436,536.86	437,987.83
Eureka P. L.	1,741,116.21	1,804,035.48
Buckeye P. L. (Macksburg)	325,616.77	364,905.35
Buckeye P. L. (Cleveland)	38,085.67	41,579.11
Buckeye P. L. (Lima, etc.)	3,110,772.07	2,982,405.14
Indiana P. L.	527,931.01	507,328.32
Cumberland P. L.	636,001.14	621,498.00
Southern P. L.	214,438.42	206,524.98
N. Y. Transit	101,414.97	117,899.23
Northern P. L.	215,880.31	247,413.61
Tidewater P. L.	1,009,357.89	862,114.87
Pure Oil	424,712.11	410,582.85
Tuscarora	12,766.39	12,283.66
Bradford Transit	114,837.03	126,446.26
Total	9,569,949.78	9,192,457.33
Decrease	333,499.75	377,392.45

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of July and August, showing gross stocks of the above fields:

	July, 1931	Aug., 1931
Pennsylvania	3,439,601.00	3,104,338.44
Lima	787,866.84	711,235.85
Kentucky	646,541.50	632,033.36
Mid-Continent	4,264,314.47	4,343,664.94
Illinois	18,123.10	.....
Michigan	413,402.87	401,179.74
Total	9,569,849.78	9,192,457.33

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1928	1929	1930	1931
Jan.	53,904	51,749	75,907	53,939
Feb.	57,003	51,833	79,256	55,162
Mar.	57,435	54,252	76,688	54,331
Apr.	56,812	53,444	84,536	54,914
May	62,067	59,902	70,646	53,344
June	58,230	58,838	75,430	54,110
July	57,144	56,087	68,921	50,722
Aug.	57,745	56,087	54,391	51,503
Sept.	53,437	57,315	56,595	.....
Oct.	53,100	76,093	53,179	.....
Nov.	53,865	74,831	52,332	.....
Dec.	53,035	74,562	52,999	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1928	1929	1930	1931
Jan.	146,465	165,731	217,623	175,369
Feb.	167,368	159,387	224,355	183,494
Mar.	158,883	161,474	228,846	189,508
Apr.	172,935	169,737	241,845	191,450
May	180,559	184,381	248,383	199,247
June	183,024	185,404	234,601	221,155
July	189,470	194,763	207,094	211,632
Aug.	192,853	194,948	205,506	234,166
Sept.	194,188	201,214	193,999	.....
Oct.	176,000	191,867	157,675	.....
Nov.	176,898	202,743	146,638	.....
Dec.	173,572	186,357	143,001	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1929	1930	1931
Jan.	7,596,564	12,230,045	11,831,099
Feb.	8,738,835	12,991,561	11,506,488
Mar.	9,002,058	13,247,217	11,012,181
Apr.	8,978,173	13,223,961	11,044,487
May	8,903,560	13,052,953	10,738,331
June	8,921,275	13,396,355	9,903,340
July	9,211,565	13,268,563	9,569,549
Aug.	9,440,643	13,047,051	9,192,457
Sept.	9,443,067	12,812,018	.....
Oct.	9,441,101	12,437,555	.....
Nov.	9,568,538	11,851,380	.....
Dec.	11,263,953	11,761,953	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, September 1	529,506.34
Runs from wells	452,755.49
Other receipts	26,243.47
Regular deliveries	351,280.47
Other deliveries	178,236.54

The amount of Illinois oil run by the Tidewater Pipe Co. in August was 23,863.07 bbls. Deliveries were 41,956.59 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1931—	Runs	Deliveries
August	476,623.56	393,231.49
1930—		
January	543,387.95	493,291.81
February	545,416.33	414,536.59
March	631,944.49	469,119.51
April	530,074.22	509,304.49
May	605,147.37	504,069.34
June	572,662.57	468,658.51
July	604,539.45	393,484.47
August	594,642.13	375,743.43
September	457,091.11	371,691.43
October	478,442.12	320,688.73
November	422,794.63	355,403.13
December	556,418.78	363,719.55
1931—		
January	468,429.04	369,573.19
February	429,284.54	461,361.85
March	424,638.23	356,663.31
April	421,614.98	382,531.65
May	433,231.80	322,511.95
June	516,805.75	320,358.13
July	530,069.38	289,219.86

Tidewater Pipe Co., Ltd., also delivered in August, 126,517.12 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1930-31—	ATLANTIC PORTS: Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS: Galveston	New Orleans, Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	6,300	6,400	25,600	12,400	9,567	61,267	.....	.....	.....	.....	2,423	63,690
October	2,516	3,065	27,358	16,419	4,903	54,161	.....	.....	.....	.....	5,355	59,516
November	3,367	6,233	33,800	17,733	4,600	70,733	.....	.....	.....	.....	4,800	75,533
December	5,516	4,323	30,645	9,678	3,580	53,742	.....	.....	.....	.....	4,645	58,387
January	5,387	6,613	31,965	14,678	11,056	67,742	.....	.....	.....	.....	6,129	68,871
February	5,787	2,715	29,143	4,000	5,750	47,393	.....	.....	.....	.....	3,750	51,143
March	10,032	1,611	21,888	7,324	8,774	49,129	.....	.....	.....	.....	6,355	55,484
April	5,133	.....	19,300	18,500	10,067	50,900	.....	.....	.....	.....	4,900	54,800
May	4,452	3,064	19,903	12,226	5,258	44,903	.....	.....	.....	.....	3,855	47,758
June	4,267	.....	23,100	8,333	3,500	39,200	.....	.....	.....	.....	.....	39,200
July	6,774	1,194	24,812	11,065	9,903	53,548	.....	.....	.....	.....	1,335	54,883
August	3,452	.....	16,419	7,419	4,290	31,580	.....	.....	.....	.....	968	32,548

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1930-31—	ATLANTIC PORTS: Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS: Galveston	New Orleans, Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	35,867	4,533	150,933	34,600	26,567	252,499	6,433	12,334	.....	2,800	22,467	274,966
October	19,839	11,742	146,194	35,365	26,967	240,097	6,065	7,967	2,774	2,645	18,451	258,548
November	39,633	35,900	134,633	36,467	34,667	281,300	3,467	7,366	.....	1,767	11,600	272,900
December	21,419	14,033	122,774	32,839	33,774	224,839	6,290	10,613	3,097	290	19,290	244,129
January	17,613	13,519	154,225	22,903	30,613	248,871	2,032	11,677	3,097	3,097	19,903	267,774
February	31,321	16,929	137,736	21,714	26,857	234,607	4,536	11,571	.....	536	16,643	251,250
March	27,645	12,935	141,160	26,290	31,129	238,161	4,065	2,580	.....	1,968	8,613	246,774
April	25,000	10,533	105,000	29,767	25,533	215,833	3,733	3,400	.....	.....	6,133	221,966
May	30,129	5,774	107,000	25,452	26,710	195,065	.....	2,000	.....	.....	2,000	200,065
June	30,067	10,833	111,767	27,000	30,833	200,500	3,500	5,500	2,167	1,333	12,500	213,000
July	26,387	11,226	104,678	29,323	21,773	193,387	6,903	7,419	4,194	.....	18,516	211,903
August	32,613	15,581	91,742	22,387	25,741	188,064	4,161	2,516	.....	2,162	9,339	197,403

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1930—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
September:	Month	17,984,306	16,509,120	23,111,822	3,405,510	1,583,220	2,008,060	3,259,010	3,396,000	71,397,100
	Daily average	599,477	550,304	770,394	113,517	52,776	66,935	107,967	113,200	2,374,573
October:	Month	18,344,053	16,632,823	23,626,553	3,517,913	1,636,552	2,142,885	3,225,550	3,627,000	72,707,929
	Daily average	588,518	536,532	762,147	113,223	52,792	69,125	104,050	117,000	2,346,130
November:	Month	18,109,469	14,941,770	23,035,322	3,459,300	1,557,870	2,156,945	3,057,100	3,222,000	69,419,976
	Daily average	603,648	498,059	734,507	115,311	51,929	71,231	98,570	107,400	2,314,199
December:	Month	17,786,728	15,057,103	21,816,310	3,432,661	1,590,951	2,167,534	3,118,663	3,222,000	68,191,950
	Daily average	573,765	485,713	703,590	110,731	51,321	69,598	100,602	107,355	2,200,645
1931—										
January:	Month	16,495,738	14,850,853	20,019,212	3,432,475	1,574,955	2,135,027	2,966,142	3,274,000	64,228,513
	Daily average	531,798	479,062	645,781	110,725	50,805	68,873	95,682	105,629	2,071,569
February:	Month	14,930,933	13,531,980	18,957,571	3,241,016	1,402,492	1,981,616	2,747,024	3,139,000	60,021,632
	Daily average	533,248	483,285	677,057	119,322	50,089	70,772	98,108	111,750	2,143,630
March:	Month	16,364,842	15,027,687	22,453,619	3,498,598	1,469,245	2,061,576	2,898,035	3,374,000	68,747,602
	Daily average	527,898	536,377	724,310	112,858	47,395	66,502	93,485	108,838	2,217,664
April:	Month	15,803,541	15,815,990	23,887,717	3,281,880	1,413,220	2,068,021	2,901,570	3,273,000	72,254,939
	Daily average	526,785	559,286	796,257	109,396	47,074	68,934	96,719	109,100	2,413,846
May:	Month	16,448,960	17,333,867	23,708,654	3,341,366	1,446,274	2,232,548	3,098,419	3,190,000	74,800,138
	Daily average	530,612	559,157	764,086	107,786	46,654	72,018	99,949	102,900	2,448,166
June:	Month	15,641,436	16,678,200	23,139,333	3,175,440	1,344,450	1,850,511	2,982,300	3,166,000	73,983,670
	Daily average	521,381	555,940	971,327	105,848	44,815	61,684	99,540	105,533	2,466,067
July:	Month	16,093,322	16,467,789	23,827,213	3,090,762	1,287,430	1,715,739	2,905,909	3,341,000	73,729,164
	Daily average	519,139	531,219	1,091,200	99,702	41,530	55,345	93,739	107,774	2,539,696
August:	Month	15,668,984	9,678,510	32,279,816	3,148,887	1,165,445	1,584,444	2,807,143	3,167,000	69,500,229
	Daily average	505,451	312,210	1,041,284	101,577	37,595	51,111	90,553	102,161	2,241,941
Total 12 months		199,562,301	185,125,492	302,857,621	40,179,838	17,471,164	24,014,930	35,851,065	39,587,000	844,649,412
Daily average		546,746	507,193	829,747	110,082	47,866	65,794	98,222	108,458	2,314,196